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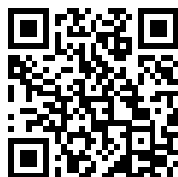
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EBONOMICS
DEPARTMENT



ASSOCIATION

OF

Railway Telegraph Superintendents

PROCEEDINGS

OF THE

Annual Meeting Held at Atlantic City, N. J.

JUNE 19th, 20th and 21st, 1907

CONSTITUTION, BY-LAWS, LIST OF MEMBERS, ETC.

Press of
J. H. Yewdale & Sons Co., Milwaukee, Wis.
1907

ANNOUNCEMENT

The Association was formed in Chicago, November 20, 1882
Its object is the improvement of the railway telegraph service.

The next annual meeting will be held at Montreal, Can., June
24th, 25th and 26th, 1908.

The undersigned will be glad to answer any inquiries in reference
to the Association.

E. P. GRIFFITH, President,

Jersey City, N. J.

W. J. CAMP, Vice-President,

Montreal, Canada.

P. W. DREW, Sec'y and Treas.

Milwaukee, Wis.

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E. L. M.

THE ASSOCIATION
OF
Railway Telegraph Superintendents

CONSTITUTION AND BY-LAWS

2987-17

PAST PRESIDENTS

W. K. Morley	1882
W. K. Morley	1883
C. Selden	1884
C. W. Hammond	1885
A. R. Swift	1886
Geo. L. Lang	1887
Geo. C. Kinsman	1888
C. A. Darlton	1889
G. T. Williams	1890
C. S. Jones	1891
L. H. Korty	1892
U. J. Fry	1893
O. C. Greene	1894
G. M. Dugan	1896
J. W. Lattig	1897
W. W. Ryder	1898
L. B. Foley	1899
W. F. Williams	1900
C. F. Annett	1901
J. H. Jacoby	1902
C. S. Rhoads	1903
H. C. Hope	1904
E. E. Torrey	1905
E. A. Chenery	1906

OFFICERS

1906-7

PRESIDENT.

E. P. Griffith.....Erie Ry.....Jersey City, N. J.

VICE-PRESIDENT.

W. J. Camp.....C. P. Ry.....Montreal, Can.

SECRETARY AND TREASURER.

P. W. Drew.....W. C. Ry.....Milwaukee, Wis.

COMMITTEES

ARRANGEMENTS.

W. J. Camp.....C. P. Ry.....Montreal, Can.
W. W. Ashald.....G. T. Ry.....Montreal, Can.
E. H. Millington.....M. C. Ry.....Detroit, Mich.
G. C. Kinsman.....Wabash.....Decatur, Ill.
M. Magiff.....Cent. Vt.....St. Albans, Vt.
S. A. D. Forristall.....B. & M.....Boston, Mass.
N. E. Smith.....N. Y. N. H. & H.....New Haven, Conn.

LADIES' RECEPTION.

Mrs. W. J. Camp, Mrs. James Kent, Mrs. W. W. Ashald,
Mrs. Thos. Rodgers, Mrs. J. F. Richardson, Miss A. Jennings,
Miss Gladys Camp.

TOPICS.

J. L. Davis.....C. & E. I. Ry.....Chicago, Ill.
E. Parsons.....Ill. Cent. Ry.....Chicago, Ill.
Percy Hewett.....Sunset Lines.....Houston, Tex.

POLE CONSTRUCTION (To Withstand Sleet and Wind Storms).

William Maver, Jr., Electrical Engineer.....New York.
C. H. Bristol, Gen'l Supt. Construction, W. U. Tel. Co.....New York.
F. F. Fowle, A. T. & T. Co.....Chicago.

LEGISLATION FOR WIRE CROSSINGS.

G. H. Groce, Ill. Central.....Chicago.
G. C. Kinsman, Wabash.....Decatur, Ill.
J. G. Jennings, C. R. I. & P. Ry.....Chicago.

COMMITTEE TO FORMULATE METHOD AND CONFER WITH GENERAL MANAGERS' ASSOCIATION.

E. P. Griffith, W. W. Ryder, C. S. Rhoads,
G. H. Groce, C. Selden.

COMMITTEE ON MATTER OF RECORD.

H. C. Hope, J. L. Davis, G. A. Cellar.

SUB-COMMITTEES ON QUARTERLY MEETINGS.

Eastern.

C. Selden, L. B. Foley, A. B. Taylor.

Western.

E. A. Chenery, J. L. Davis, C. S. Rhoads.

LIST OF ACTIVE MEMBERS

Name.	Railroad.	Address.
E. P. Griffith.....	Erie.....	Jersey City, N. J.
E. A. Chenery.....	Missouri Pacific.....	St. Louis, Mo.
E. E. Torrey.....	M. & O.....	Jackson, Tenn.
H. C. Hope.....	C. St. P. M. & O.....	St. Paul, Minn.
C. S. Rhoads.....	C. C. C. & St. L.....	Indianapolis, Ind.
W. F. Williams.....	S. A. L.....	Portsmouth, Va.
L. B. Foley.....	D. L. & W.....	New York, N. Y.
W. W. Ryder.....	C. B. & Q.....	Chicago, Ill.
O. C. Greene.....	Northern Pacific.....	St. Paul, Minn.
U. J. Fry.....	C. M. & St. P.....	Milwaukee, Wis.
L. H. Korty.....	Union Pacific.....	Omaha, Neb.
C. Selden.....	Baltimore & Ohio.....	Baltimore, Md.
G. C. Kinsman.....	Wabash.....	Decatur, Ill.
C. P. Adams.....	Southern.....	Washington, D. C.
G. H. Groce.....	Illinois Central.....	Chicago, Ill.
E. H. Millington.....	Michigan Central.....	Detroit, Mich.
H. C. Sprague.....	St. L. & S. F.....	Springfield, Mo.
M. Magiff.....	Central Vermont.....	St. Albans, Vt.
A. B. Taylor.....	N. Y. C. & H. R.....	New York.
F. G. Sherman.....	C. R. R. of N. J.....	Jersey City, N. J.
S. K. Bullard.....	M. K. & T.....	Sedalia, Mo.
P. W. Drew.....	Wisconsin Central.....	Milwaukee, Wis.
C. B. Phelps.....	L. & N.....	Louisville, Ky.
C. H. Gaunt.....	A. T. & S. F.....	Topeka, Kan.
W. A. Freese.....	C. & A.....	Bloomington, Ill.
W. W. Ashald.....	G. T.....	Montreal, Can.
Wm. Kline.....	L. S. & M. S.....	Toledo, O.
E. A. Klippel.....	O. R. & N.....	Portland, Ore.
V. T. Kissinger.....	B. & M. R.....	Lincoln, Neb.
N. E. Smith.....	N. Y. N. H. & H.....	New Haven, Conn.
F. L. Blendinger.....	L. V. Ry.....	New York, N. Y.
G. W. Dalley.....	C. & N. W.....	Chicago, Ill.
J. G. Jennings.....	C. R. I. & P.....	Chicago, Ill.
S. A. D. Forristall.....	B. & M.....	Boston, Mass.
J. B. Fisher.....	P. R. R.....	Philadelphia, Pa.
W. S. Melton.....	Q. & C.....	Chattanooga, Tenn.

Name.	Railroad.	Address.
B. F. Frobes.....	O. S. L.....	Salt Lake City, Utah.
J. S. Stevens.....	C. & O.....	Richmond, Va.
G. A. Cellar.....	Pa. Lines W. of Pitts..	Pittsburgh, Pa.
E. J. Little.....	Great Northern.....	St. Paul, Minn.
W. C. Walstrum.....	N. & W.....	Roanoke, Va.
F. S. Spafard.....	C. R. I. & P.....	Chicago, Ill.
J. P. Boyle.....	K. & W.....	Centerville, Iowa.
W. P. McFarlane.....	F. E. & M. V.....	Omaha, Neb.
L. S. Wells.....	L. I. R. R.....	Long Is. City, N. Y.
G. B. McCoy.....	Y. & M. V.....	Greenville, Mass.
H. A. Tuttle.....	M. St. P. & S. S.....	Minneapolis, Minn.
F. A. C. Ferguson.....	Miss. Valley.....	Wilson, La.
W. L. Bisbee.....	H. & T. C.....	Austin, Tex.
W. P. Cline.....	A. C. Line.....	Wilmington, N. C.
A. E. Roome.....	So. Pac.....	San Francisco, Cal.
R. L. Logan.....	K. C. So.....	Kansas City, Mo.
C. M. Lewis.....	P. & R.....	Reading, Pa.
J. M. Walker.....	D. & R. G.....	Denver, Colo.
C. A. Parker.....	D. N. W. & P.....	Denver, Colo.
J. L. Davis.....	C. & E. I.....	Chicago, Ill.
J. L. Henritzky.....	C. & S.....	Denver, Colo.
W. H. Potter.....	Southern.....	Washington, D. C.
Percy Hewett.....	Sunset Lines.....	Houston, Tex.
E. Parsons.....	Illinois Central.....	Chicago, Ill.
E. E. McClintock.....	C. & W.....	Denver, Colo.
W. J. Camp.....	C. P.....	Montreal, Can.
E. W. Day.....	B. & O.....	Baltimore, Md.
B. Weeks.....	Illinois Central.....	Memphis, Tenn.
J. C. Browne.....	St. L. I. M. & S.....	Little Rock, Ark.
F. E. Bentley.....	T. R. R. Assn.....	St. Louis, Mo.
J. L. Orbison.....	C. H. & D.....	Cincinnati, O.
F. H. Van Etten.....	Sou. Ind.....	Chicago, Ill.
C. L. Lathrop.....	P. S. & N.....	Angelica, N. Y.
I. T. Dyer.....	S. P. L. A. & S. L. R. R..	Los Angeles, Cal.
A. S. Foote.....	Sunset Lines.....	Houston, Tex.
S. L. Van Akin.....	N. Y. Central.....	Syracuse, N. Y.
L. M. Jones.....	A. T. & S. F.....	Topeka, Kas.
E. A. Patterson.....	C. M. & St. P.....	Milwaukee, Wis.
G. A. Dornberg.....	Pa. Lines W. of Pitts..	Pittsburgh, Pa.

ASSOCIATE MEMBERS

A. P. Eckert	New York.
C. E. Brown	Chicago.
Henry W. Sperry	New York.
C. E. Yetman	New York.
Byron C. Eldred	New York.
E. W. Vogel	Chicago.
J. J. Ghegan	New York.
M. J. O'Leary	New York.
Howard E. Merrill	New York.
B. A. Kalser	New York.
R. D. Brixie	New York.
F. F. Fowle	Chicago.
Jay G. Mitchell	Cleveland, O.
H. O. Rugb	Sandwich, Ill.
John Langan	New York.
H. P. Clausen	Chicago.
Alex. Henderson	Chelsea, Mass.
N. R. Fill	St. Louis, Mo.
W. B. Glardon	Denver, Colo.
Edwin R. Gill	New York.
J. C. Kelsey	Chicago.
Geo. M. Dodge	Valparaiso, Ind.
Harrison Osborn	New York.
Wm. H. Merrill	New York.
S. Johnson	New York.

HONORARY MEMBERS

Thos. A. Edison.	R. C. Clowry.
John B. Taylor.	W. C. Brown.
T. D. Lockwood.	Geo. W. Stevens.
Ralph W. Pope.	Marvin Hughitt.
J. C. Barclay.	W. M. Greene.
J. B. Stewart.	T. P. Cook.
A. J. Earling.	F. S. Gannon.
C. H. Bristol.	Geo. T. Williams.
C. E. Freeman.	Belvidere Brooks.
Wm. Maver, Jr.	I. N. Miller.
Geo. C. Mavnard.	T. R. Taltavall.
W. K. Morley.	J. W. Fortune.
F. P. Valentine.	W. J. Murphy.
W. E. Gilmore.	C. D. Gorham.
H. V. Miller.	Charles McLaughlin.
H. F. Houghton.	J. B. Taltavall.
J. F. Wallick.	E. A. Smith.
J. Levin.	C. G. Sholes.
J. R. Terhume.	A. R. Swift.
James Kent.	E. Borden.
G. F. Weldman.	F. E. Clary.
J. H. Jacoby.	C. A. Darlton.
G. M. Dugan.	C. F. Annett.
W. J. Holton.	Geo. L. Lang.

ATTENDANCE

ACTIVE MEMBERS.

E. A. Chenery, wife and daughter, Mo. Pacific Ry., St. Louis, Mo.
E. P. Griffith, wife and daughter, Erie Railway, Jersey City, N. J.
W. F. Williams, wife and daughter, Seaboard Air Line Railway,
Portsmouth, Va.
F. G. Sherman, wife and daughter, C. R. R. of N. J., Jersey City,
N. J.
W. W. Ryder, and wife, C. B. & Q. Ry., Chicago, Ill.
C. P. Adams, wife and daughter, Southern Railway Company,
Baltimore, Md.
A. B. Taylor, N. Y. C. & H., Grand Central Station, N. Y.
John L. Davis, wife and daughter, C. & E. I., Chicago, Ill.
P. W. Drew, and wife, W. C. Ry., Milwaukee, Wis.
W. P. Cline, and wife, Atlantic Coast Line, Wilmington, N. C.
W. C. Walstrum, Norfolk & Western, Roanoka, Va.
W. J. Camp, and wife, Can. Pacific, Montreal, Can.
V. T. Kissinger, and wife, C B. & Q., Lincoln, Neb.
W. S. Melton, C. N. O. & T. P. and A. G. S. R. R., Chattanooga, Tenn.
H. C. Hope, and daughter, C. St. P. M. & O., St. Paul, Minn.
C. S. Rhoads, and wife, C. C. C. & St. L. Lines, and N. Y. C. Lines,
Indianapolis, Ind.
S. K. Bullard, and wife, M. K. & T., Sedalia, Mo.
C. S. Lathrop, and wife, P. S. & N., Angelica, N. Y.
J. S. Stevens, C. & O., Richmond, Va.
G. H. Groce, Ill. Central, Chicago, Ill.
G. A. Cellar, Pa. Lines west of Pittsburg, Pittsburg, Pa.
U. J. Fry, C. M. & St. P., Milwaukee, Wis.
J. B. Fisher, Penna. R. R., Philadelphia, Pa.
C. M. Lewis, P. & R., Reading, Pa.
E. Parsons, wife and daughter, Ill. Central, Chicago, Ill.
Percy Hewett, and wife, Sunset Route, Houston, Texas.
S. L. Van Akin, Jr., N. Y. C. & H. R. R., Syracuse, N. Y.
G. A. Dornberg, Penna. Lines, west, Chief Lineman, Pittsburg, Pa.
G. W. Dailey, C. & N. W., Chicago, Ill.

ASSOCIATE MEMBERS.

Sidney Johnson, Union S. & S. Co., New York.
J. C. Kelsey, Kellogg Switchboard & Supply Co., Chicago, Ill.
B. A. Kaiser, and wife, A. T. & T. Co., New York City.
Bryson E. Eldred, and wife, Duplex Metals Co., New York City.
E. N. Vogel, and wife, The Railway Supply Co., Chicago, Ill.
Edwin R. Gill, U. S. Electric Co., New York.
H. O. Rugh, Sandwich Electric Co., Sandwich, Ill.
A. P. Eckert, Safety Ins. Wire & Cable Co., New York.
Harrison Osborne, U. S. Electric Co., New York.
John J. Ghegan, J. H. Bunnell Co., New York.
Howard E. Morrell, U. S. Electric Co., New York.
John B. Taylor, General Electric Company, Schenectady, N. Y.
J. G. Mitchell, North Electric Co., Cleveland, Ohio.
Henry M. Sperry, General Railway Signal Co., New York City.

HONORARY MEMBERS.

J. B. Taltavall, wife and daughter, Telegraph Age, 253 Broadway,
New York.
C. F. Annett, W. U. T. Co., New Haven, Conn.
Thomas R. Taltavall, and wife, Electrical World, 114 Liberty St.,
New York.
William Maver, Jr., and wife, Electrical Engineer, New York City.

VISITORS.

C. M. Thompson, Kellogg Switchboard and Supply Co., Philadelphia.
P. W. Miller, Am. T. & T. Co., New York.
Cloyd Marshall, United Wireless Tel. Co., New York.
Val. B. Mintun, wife and daughter, M. & K. T. Co., Kansas City, Mo.
W. E. Harkness, Western Electric Co., Chicago, Ill.
Robert E. Chetwood, Jr., Am. T. & T. Co., New York.
W. F. Crowell, N. Y. Tel. Co., New York.
A. N. Bullens, N. E. T. & T. Co., Boston, Mass.
A. G. Francis, Chicago Telephone Co., Chicago, Ill.
M. O. Nevill, M. & Kan. Tel. Co., Kansas City, Mo.
G. S. Huntress, Jr., D. & H. T. & T. Co., Philadelphia.

CONSTITUTION

ARTICLE I.

Title.

The organization shall be known as "The Association of Railway Telegraph Superintendents."

ARTICLE II.

Object.

The object of this Association shall be: "The Improvement of the Telegraph Service," and the promotion and advancement in general of the interests of the telegraph department of railroads.

ARTICLE III.

Who May be Members.

Sec. 1. The membership of the Association shall be of three classes: Active, Associate and Honorary.

Sec. 2. Who may be Active Members:

Anyone connected in an official capacity with the telegraph, telephone, electric light, electric power, or electric signal department of any railroad, may become an Active Member of this Association, by subscribing to the Constitution and paying into the Treasury \$5.00 per annum and receiving a majority vote of the members present.

Sec. 3. Who may be Associate Members:

Anyone connected with a telegraph or telephone supply house or publication may become an Associate Member, subject to receiving a majority vote of the members present and paying into the Treasury \$5.00 per annum.

Associate Members shall be entitled to all the rights and privileges of Active Members, except that they shall not be allowed to vote.

Sec. 4. Who may be Honorary Members:

Men prominent in Railway Telegraph or Telephone circles, and those who have by furnishing papers and otherwise contributed to the success of the Association, and any Active Member, who is in good standing as to payment of dues, leaving the service of railroad companies or of the departments mentioned in Sec. 2, may become an Honorary Member upon receiving a majority vote of members present. Honorary members shall be entitled to all the rights and privileges of Active Members except that they shall not be allowed to vote.

ARTICLE IV.

Officers.

The officers of this Association shall be elected by ballot, and shall hold office for one year, or until their successors are chosen. They shall consist of a President, Vice-President, Secretary and Treasurer; the last two offices may be filled by one person. The officers of this Association shall constitute an Executive Committee.

ARTICLE V.

Duties of Officers.

President—The President shall preside at all meetings of the Association, and perform such other duties as are generally performed by that officer.

Vice-President—The Vice-President shall preside in the absence of the President, and when so acting shall be governed by the rules prescribed for that officer.

Secretary—The Secretary shall keep correct minutes of each meeting, and cause the same to be printed immediately after adjournment, and send to each member two copies of the same. He shall also notify the members, by circular,

of the time and place of each meeting, and perform such other duties as may be required by the Executive Committee.

Treasurer—The Treasurer shall collect all moneys due the Association, giving his receipt therefor, pay all bills contracted for by it, upon the approval of the Executive Committee, and at each annual meeting render a detailed statement of the receipts and expenditures of the previous year, which statement shall be printed with the proceedings of the meeting at which it is presented. In order to meet expenses in excess of the receipts from annual dues, he shall levy a pro rata assessment upon the members of this Association.

ARTICLE VI.

Vacancies.

In case of a vacancy in any office, it shall be filled for the remainder of the year by the Executive Committee.

ARTICLE VII.

Seven members shall constitute a quorum at any meeting.

Amendments to the Constitution.

This constitution shall be changed only by an amendment offered in writing at a regular meeting, one month's notice having been given to each member by the Executive Committee, and can only be adopted by an affirmative vote of two-thirds of the members present.

BY-LAWS

1. The Executive Committee is authorized to declare applicants acting members previous to the annual meeting.

2. The annual meeting of this Association shall be held at such time and place as shall be designated by the majority vote of members at a previous meeting.

3. Special meeting may be held upon the call of the Executive Committee, when requested by seven or more members.

4. Any member who is in arrears in payment of dues ninety days after the annual meeting shall be considered suspended, and should dues not be paid on or before the succeeding annual meeting, his name shall be dropped from the roll of membership.

At all meetings the following shall be the order of business:

1. Election of New Members.
2. Reading the Minutes of Regular and Special Meetings.
3. Report of Treasurer.
4. Reports of Standing Committees.
5. Reports of Special Committees.
6. Election of Officers.
7. Miscellaneous Business.
8. Adjournment.

**Minutes of the Proceedings of the
Twenty-sixth Annual Convention,
Association of Railway Telegraph
Superintendents, held at Atlantic
City, N. J., June 19th, 20th and
21st, 1907.**

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.

Twenty-Sixth Annual Convention.

ATLANTIC CITY, N. J.,

June 19, 20 and 21, 1907.

The Twenty-sixth Annual Convention of the Association of Railway Telegraph Superintendents was held at the Marlborough-Blenheim Hotel, Atlantic City, N. J., June 19, 20 and 21, 1907.

FIRST DAY—MORNING SESSION.

(Wednesday, June 19, 1907.)

The convention was called to order by President E. A. Chenery, M. P. Ry., St. Louis, Mo., at 10:30 o'clock A. M.

President Chenery: Ladies and Gentlemen: At former meetings it has been customary for the Mayor or representative of the municipality in which the meetings have been held, to deliver an address of welcome, but because of the many interesting papers to be presented at this session, which will consume all of the time we can devote to them in the two days we are to be here, it was decided to cut out the feature of a formal address of welcome and the customary response. For that, I, perhaps, owe you an apology. Before we came into this room the matter was brought up as to who was to address the meeting, and I stated it was my understanding that no provision had been made. I was asked what under the

sun we wanted the ladies to come for. "Well," I said, "if for nothing more, to give me an opportunity to look at them, and derive the inspiration I certainly will have in looking at their faces."

I assure you that it is gratifying to your officers to see such an intelligent and good-looking gathering as we have at this twenty-sixth annual convention of this association. I am sure that the papers to be read will be interesting and will receive such discussion as they deserve by the members present, who have been furnished with a list of the topics.

That the ladies will be taken care of there is not a shadow of doubt. I do not know whether the fishing and bathing is very good this morning, but they tell me sights can be seen from the boardwalk, which ordinarily to us inland people can only be observed from shop windows or standing on the street corners vis-a-vis. I am reminded of Shakespeare: "The apparel oft proclaims the man." It won't be necessary to devote very much time in attempting to seek out the man.

I will say that this association was formed for the purpose of improving the telegraph service, as you all know. That it has come up to expectations I do not think any member present will question. We aim, each year, to have interesting papers and to discuss matters of benefit to the roads we represent, and there is no question, even though the papers may not have been as numerous as they are at this meeting, but what a good deal of benefit has been derived by the members of the association. Frequently we have occasion to take up matters with our neighbors to know of their methods about maintenance, etc., and when in cold-blooded type, you might say, you don't always

get the results. Therefore, the getting together personally is certainly of great benefit. I say that particularly to the members of the association, at least the active members. The associate members who meet with us are always willing and always do give us a great deal of their time and provide exhibits for our entertainment, which certainly are of much interest and benefit.

At this meeting there is to be a report from the committee on "uniformity of superintendents' duties," and a paper to be presented, entitled: "The superintendent of telegraph; what he is versus what he is not." Whether these two subjects will solve the question, there is no question but what the superintendent of telegraph is a handy man to have in the official family. He is consulted not only on the method of moving messages over the wires, but is brought into other matters of transportation interest.

I shall not take up your time longer with a speech. As my friends know, I cannot talk very well unless they corner me. You have found that out occasionally. Besides, the president of the convention, as I understand, is presumed to curb any unnecessary talk.

Before adjourning for a period of five minutes, as is customary, to permit the ladies to become better acquainted with each other, or to make up their minds whether they wish to stay with us and participate in the discussions or go on the boardwalk, we would like to hear from the entertainment committee. I do not know that any special feature has been provided for the ladies, but we would like to hear from the chairman, Mr. Selden.

Mr. Selden: When our committee had its meeting here we found there was no place to which we could make an

excursion. New York is nearby and so is Philadelphia, but so far as Atlantic City is concerned we felt that the members could find their own pleasure. So far as a welcome to this city is concerned, we felt we were welcome.

President Chenery: Just before we opened our exercises—I was going to say services—a photographer stated he would like, if possible, to have the “bunch” assemble and have their picture taken. While we gave him no particular encouragement, I thought, perhaps, we might meet here at 2 o’clock, say, and then if we so conclude, our picture can be taken, and such members as would like to take one home will be given that opportunity.

Secretary Drew: I want to bring to your attention the very important matter of having the attendance cards filled out. Any who have not received cards can get them here, and those who have will please send them to the Secretary’s desk. This is a very important feature, because if any of the names are missed of those here, of course, our minutes do not show they are present. We had at one time occasion to verify the attendance of one of the members who told his wife that he had gone to the association meeting. Unfortunately he did not fill out a card and I had to personally prove that he was present. (Laughter.)

President Chenery: Unless I hear some objections we will take a recess for five minutes in order to permit the members to give their excuses to their wives and sweethearts as to their conduct on the boardwalk.

(RECESS.)

Upon re-convening—

President Chenery: The first order of business, according to the by-laws, is the election of new members. We will hear from the Secretary.

Secretary Drew: Gentlemen, we have the following, who desire membership in our association:

ACTIVE.

J. L. Henritzy, C. & S. Ry.....Denver, Col.
 L. M. Jones, Asst. Supt. Tel. A. T. & S. F.....Topeka, Kas.
 S. L. Van Akin, Jr., Asst. Supt. Tel. N. Y. Cen.....Syracuse, N. Y.
 W. S. Melton, Supt. Tel. Q. & C.....Chattanooga, Tenn.
 G. A. Dornberg, Chief Lineman P. Lines W. of P...Pittsburgh, Pa.
 J. B. Fisher, Supt. Tel. Pa. R. R.....Philadelphia, Pa.
 E. A. Patterson, Asst. Supt. Tel. C. M. & St. P....Milwaukee, Wis.

ASSOCIATE.

Byron C. Eldred, Sec. & Tr. Duplex Metal Co. 208 5th Av., New York.
 John Langan, Okonite Co.....253 Broadway, New York.
 Howard E. Merrill, U. S. Elec. Co.....New York.
 Harrison Osborn, U. S. Elec. Co.....New York.
 Wm. H. Merrill, U. S. Elec. Co.....New York.
 Jay G. Mitchell, No. Elec. Co.....Cleveland, O.
 R. D. Brixey, Kerite Cable Co.....203 Broadway, New York.
 S. Johnson, Union Sw. & Sig. Co.....143 Liberty St., New York.
 H. M. Sperry, Res. Mgr. Genl. Ry. Sig. Co....525 5th Av., New York.
 Geo. M. Dodge.....Valparaiso, Ind.

HONORARY.

Geo. L. LangChattanooga, Tenn.
 W. J. Holton.....Chicago, Ill.
 John B. Taylor, Genl. Elec. Co.....Schenectady, N. Y.

Mr. Selden moved that the Secretary cast the ballot electing the applicants.

And agreed to.

Which was duly seconded,

Secretary Drew: I have an announcement to make of the death of J. H. Reid, associate member, of Philadelphia. Mr. Reid never attended any of our meetings, but he joined as an associate member and was a member for a year. I received a letter from his wife, when I sent him a copy of last year's minutes, advising me of his death.

Also, our old friend and former member, Kenneth Mackenzie, who passed away about the time of our meeting at Denver, but we did not receive notice in time to get it in our last year's minutes. We wish to record him, also, as one of our members who has passed away. No action, however, is necessary in these cases.

President Chenery: Next in order is the reading of the minutes of the regular and special meetings. Inasmuch as the minutes of the last regular meeting have been published and distributed, it would be in order for a motion to prevail to dispense with the reading of the minutes and that they be approved as printed.

Mr. Hope moved the reading of the minutes be dispensed with and that they be approved as printed,

Which was duly seconded,

And agreed to.

President Chenery: I will say in connection with the special meeting, it may not be out of place to mention the fact that some of the western members this past winter thought it advisable to get together on some certain matters that were confronting them, and meetings were held in Chicago and St. Louis nearly every month. While we did not attempt a complete record of the transactions, I believe it has been recognized by all those in attendance that such meetings were beneficial. It occurs to me it might not be a bad idea—perhaps, every quarter, if you please, to get together in the west, and, perhaps, also, in the east, and exchange ideas as to certain matters that might come up. One of the advantages of those meetings was that we were able to put out feelers as to matters to be discussed before this convention. I think we accomplished

something. Our able chairman of the Executive Committee certainly worked hard. I merely make this as a report as to what those special meetings did.

Secretary Drew: In connection with that feature, I would like to offer now this circular, which was distributed to all the members of the association, but which originated in those sub-meetings at Chicago and St. Louis. The President and myself took it upon ourselves, as a majority of the Executive Committee, to authorize the printing of this, and, in order to clear our record and make the thing legitimate I would suggest that some one make a motion that this association approve the action of the Executive Committee in having this circular printed, a circular which, as you probably are aware—perhaps some of you are not, but most of you are—was in regard to wire crossings over railroads, to try to get as far as possible a uniform state law to protect us, as railroad men, from the great injury we are receiving from inefficient wire crossings that are being put over our railroads almost every half mile, and this was the result. We received quite a little benefit, as several of the states did pass a law as we suggested, with some variations, of course, in accordance with the local conditions. I would suggest that this matter be approved, so it can go on our record.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.

Secretary's Office.

Care Wisconsin Central Railway.

Milwaukee, Wis., Dec. 24, 1906.

To the Members:

Association of Railway Telegraph Superintendents.

Gentlemen: The necessity for legislation regulating wire crossings has long been apparent to this Association and

made the subject of considerable discussion at our annual conventions.

As a protection to trainmen as well as to guard against interference to the railway telegraph wires, there should be uniform laws in the several States to enforce safe construction and proper maintenance of wires crossing our railroad tracks.

At a meeting held in Chicago on Tuesday, December 18th, 1906, the matter was thoroughly discussed and the following motion made by Mr. Ryder, seconded by Mr. Dailey, unanimously carried:

"That it is the sense of the Association of Railway Telegraph Superintendents that a law should be passed in all States, not now having such statute, to provide greater protection to the lives of trainmen and to minimize interference with railway wires.

"Be it therefore resolved, that an amended copy of the Michigan Law No. 171, with the reference to grade track crossings eliminated and an addition of the wording of the Wyoming Law 'Protection to Trainmen,' be referred to the Law Department of the various railroads with recommendation that an effort be made to secure the passage of a similar law in the various States through which our roads operate."

Below is an amended form of the Michigan Law suggested:

PROTECTION OF TRAINMEN.

AN ACT for the protection of trainmen and to regulate the stringing of wires, electric or other, over railroad tracks, and relative to the maintenance of such wires heretofore so strung.

SEC. 1. The people of the State of enact, That it shall hereafter be unlawful for any corporation or person to string any wire, electric or other, over the tracks of any railroad company, except at such places and in such manner as shall be approved by the Railway Commission (or other proper authority) and any corporation or person desiring to so string any wire shall give the railroad company notice in writing of the place where and the manner in which it desires to string the same, and the place where and the time when it will apply to the Railway Commission (or other proper authority) for approval as above required, which notice shall be served at least ten days before the time of hearing of such application.

SEC. 2. Said Railway Commission (or other authority) shall also, as soon as possible after the passage of this act, either by personal examination or otherwise, obtain information as to all places where the tracks of railroad are crossed by wires strung over said tracks and wherever in its judgment, such wires should be raised to a greater height or other thing done with reference thereto, to guard against accidents, shall order such change or changes to be made, and shall apportion any expense incident thereto between the companies or persons affected as may be deemed just and reasonable, PROVIDED, That in no case shall the height of any wire strung across such railroad tracks be less than twenty-five feet, excepting trolley wires, which shall not be less than twenty-two feet from the top of rail of said railroad tracks.

SEC. 3. It shall be the duty of every corporation and persons to whom an order made by the Railway Commission (or other proper authority) under this act shall be directed, to comply with such order in accordance with its terms, and

for any neglect to so comply therewith, any such corporation or person shall be liable to a penalty of one hundred dollars and to a like penalty for every ten days during which said neglect shall continue. Any such penalty may be recovered in an action of assumpsit brought in the name of the people of this State, and it shall be the duty of the prosecuting attorney of the proper county to bring any such action at the request of the Railway Commission (or other proper authority).

The action taken has been favorably passed upon by the Executive Committee of this Association and the matter is now respectfully submitted, suggesting that each member through his legal department, endeavor to secure the passage of a law at the present or coming session of the legislature of the State in which he is affected, in accordance with the above resolutions.

Yours truly,

Approved:

P. W. DREW,

E. A. CHENERY,

Secretary.

President.

Mr. Selden moved that the action of the Executive Committee be approved.

Which was duly seconded.

And agreed to.

Mr. Camp: Can the circular be embodied in the minutes of this year?

Secretary Drew: Yes, sir.

Mr. Ryder: I would like to ask what States did pass it.

President Chenery: Wyoming was one of the States.

Mr. Selden: I have received invitations to attend these meetings, but it has been impossible for me to do so, much

as I desired to. This country is pretty large, and I want to advance the thought, would it or wouldn't it be well for us to have two authorized committees, one to be known as the eastern and the other as the western, so that the eastern members, including the south, could reach some point with the members from New England, New York, and, possibly, as far west as Ohio and the western people take up the section that would meet that, and then whatever was done by one committee would be passed to the other, so that each one would be informed as to what is being done in their particular line. A chairman could be selected for each. The committees could get together and there could be an interchange of what was done by the committees. I do not intend to put that in the form of a motion.

Mr. Hope: I agree with Mr. Selden. The Railway Associations have quarterly meetings, and have two vice-presidents, one in the east and the other in the west, and many of the members can attend either one and help prepare subjects for the annual meetings.

Mr. Taylor: As chairman of the Topic Committee, I would like to correct the impression our President has made relative to the value of the services of the chairman of the Topic Committee. I think the credit is due largely to the action taken at Chicago—more so than to my part of the work. Other members were active too.

Secretary Drew: The Association of Transportation and Car Service Officers, of which I am also a member, has a similar arrangement. They have an eastern association and a western association, and then the general association which combines both. Now, these eastern and western

associations meet twice a year and their last meeting is held a short time prior to the annual meeting, so that any topics that are brought up by them are referred to the general meeting for action. These smaller associations do not do anything except suggest and recommend. They take no formal action. That is left with the general association, which meets every May. I think, as Mr. Selden has said, owing to the great distance some of us have to travel, it is certainly a very wise plan, and I would suggest that it would not be out of place for a committee of three or five to be appointed right here and now to formulate some plan or suggest something that could be brought before us later in the meeting for action.

President Chenery: We have a number of important papers to be read to-day, but I know of no subject that is more worthy of consideration than this matter that is now before you. I will be very glad to hear a motion made.

Mr. Camp moved that a committee, as suggested by the Secretary, be appointed, to arrange a plan and bring it before the meeting to-morrow,

Which was duly seconded,

And agreed to.

TREASURER'S REPORT.

Secretary Drew presented the following:

RECEIPTS.

Cash on hand	\$ 70.00
Dues	385.00
Advertisements	225.00
Minutes sold	12.50
Total	<hr/> \$692.50

EXPENDITURES.

Minutes—Stenographer, Printing, Etchings and Postage	\$248.50
Printing Circulars and Attendance Cards.....	12.75
Printing Stamped Envelopes	11.75
Stenographic Work	2.00
Badges	23.25
Expressage	1.25
Secretary's salary	300.00
Cash on hand	93.00
Total	<hr/> \$692.50

Mr. Selden moved the report be accepted,

Which was duly seconded,

And agreed to.

REPORT OF COMMITTEE ON TOPICS.

Mr. A. B. Taylor, chairman, presented the following report:

List of Papers to be Read at Annual Meeting of Association of Railway Telegraph Superintendents, to be Held at Atlantic City, June 19 and 20th, 1907.

By H. C. Hope, C. St. P. M & O. R. R.—Education of Telegraphers in Railroad Work.

By F. E. Bentley, Terminal Railway Ass'n, St. Louis—The Superintendent of Telegraph: What He is Versus What He is Not.

By S. L. Van Akin, Jr., New York Central & Hudson River R. R.—Maintenance and Operation of Telephone Service on Railroad Company's Lines.

By R. L. Logan, Kansas City Southern—Error Sheets.

By G. W. Dailey, Chicago & Northwestern R. R.—Opportunities in the Telegraph Service.

By G. A. Cellar, Pennsylvania Lines—Experiments with Concrete Poles.

By W. W. Ashald, Grand Trunk Railway—Visible Supply of Poles.

By E. Parsons, Illinois Central—Uniformity of Office Installation.

By W. J. Browne, Iron Mountain Road—Operation and Maintenance of Railway Telegraph Service.

By W. J. Camp, Canadian Pacific Railway—Standard Time.

By U. J. Fry, C. M. & St. P. Railway—Dry Batteries.

By L. M. Jones, A. T. & S. F. Railway—Wire Testing.

By Wm. Maver, Jr., New York—Wireless Telegraphy.

By Robert E. Chetwood, Engineering Department, A. T. & T. Co., New York—The Use of Special Instruments in Telephone Service.

By W. C. Stowell, Chicago & Alton—Inductive and Other Foreign Disturbances to Telegraph Lines.

By John B. Taylor, Railway Engineering Department General Electric Company—Inductive Disturbances to Telegraph Wires Caused by High Tension Lines Paralleling Railroad Right of Way.

Mr. Taylor: More than a sufficient number are here this morning to make our meetings interesting. Some of the writers we expect will not be here in time to read their papers. The success which has attended the efforts of the committee, as I stated, is due largely to the action of the meeting in Chicago.

Mr. Selden moved the thanks of the association be tendered the Topic Committee and the committee be discharged,

Which was duly seconded,

And agreed to.

President Chenery: I will accept the suggestion made by the Secretary, and believe it would be well to enter into the reading of the papers.

Secretary Drew: There was one gentleman who spoke to me this morning, who wanted to have his paper read early in the meeting as he expected to be obliged to go away.

President Chenery: Mr. Taylor.

Secretary Drew: Wouldn't it be well to have Mr. Taylor read his paper right now, and, if he is obliged to go away he will be at liberty to go, but we will have the benefit of his presence while his paper is being discussed.

President Chenery: Before that is acted upon I want to say that, perhaps, we of the southwest are more interested in this paper than certain other members. I am particularly anxious to get as many members present during the reading of the paper as possible. I talked with Mr. Taylor this morning and feel satisfied it will be agreeable to him to defer the reading of his paper until this afternoon at least, or possibly to-morrow morning. Therefore, unless Mr. Taylor wishes to change that I will put it off.

Mr. Taylor: It would be satisfactory to-morrow afternoon or even to-morrow evening.

President Chenery: The first paper on the list, and deservedly so, is one by H. C. Hope, entitled "Education of Telegraphers in Railroad Work." It seems to me it would be well to have that paper first, and I therefore call upon Mr. Hope.

Mr. Hope read the following paper:

EDUCATION OF TELEGRAPHERS IN RAILROAD WORK.

By Henry C. Hope, of St. Paul Minn.
Superintendent of Telegraph and Signals, Chicago, St. Paul,
Minneapolis, and Omaha Railway Company.
All telegraphers are employed, examined and instructed

in the office of the superintendent of telegraph and signals of the Chicago, St. Paul, Minneapolis and Omaha Railway Company, and a rigid written and oral examination is required before any are allowed to enter the service.

Upon receiving inquiry for employment, and the applicant giving signs of having a suitable education, with stability, intelligence and experience, he is sent an application blank showing the requirements, and same, when returned properly filled out, is filed for future reference. A vacancy occurring, the applications are inspected and the most promising man selected.

Upon arrival of the applicant at headquarters, he is taken in charge by the chief operator and examined as to his ability as a telegrapher. Due allowance is made for natural nervousness of the candidate under examination and every opportunity is afforded him to show what he can do. To meet the standard he has to copy three train orders in succession of different phraseology. They must be of legible penmanship and correct without a scratch or fumble, interlineation or alteration, at a rate of speed from twenty-three to thirty words per minute, averaging five letters per word, and he must correctly transmit and repeat back the same at same average speed. Otherwise he is rejected. Sometimes several applicants in a day are rejected. After passing examination in telegraphy, his letters of recommendation or service cards from previous employers are called for and a copy of same made. They must show a clear record for the previous five years. His credentials are returned to him. If he has no credentials, he is required to wait until his previous employers are communicated with by wire and his record established. Letters of

recommendation are verified by mail or wire to insure their being genuine.

The applicant is required to fill out three application blanks, one for the superintendent of telegraph and signals, one for the general superintendent and one for the claim agent. These blanks have a printed form on reverse side for the chief operator's report of examination, that is, proficiency in telegraphy and standard on sight, hearing and colors.

To pass a normal physical examination, an applicant must be able to read with each eye separately printed letters one-half inch long, composed of lines an eighth of an inch wide on a chart at a distance of twenty-four feet. He must hear the tick of a watch with each ear separately at a distance of thirty-six inches. Where the ratchet acoumeter is used the examinee must call off the clicks numerically as they are produced by the examiner, first slowly, then rapidly, first in regular time singly, then by twos and three with a pause between each two groups of clicks at the required distance. He must group in each class to which they belong five different shades of the following colors (using the Thompson Yarns): red, green, blue, yellow, pink, brown and white. The Williams lantern is also used in making an examination on colors. The examinee, at a distance of twenty feet, must call off the names of the different colors as they are given by flash light in rapid succession at the option of the examiner. The lenses vary in diameter, the largest representing switch lights at a distance of 150 feet, the next 600 feet and the smallest 1,300 feet.

It is found that ten per cent. of the applicants are disqualified by reason of defective eyesight, three per cent.

by defective hearing, and six per cent. by defective color perception.

If the applicant's record is found to be acceptable, a book of rules is given him to study, and afterwards a pamphlet entitled "Operators' Examination," in which he must answer upwards of two hundred questions in writing bearing on the duties of a telegrapher. These answers are checked over and the writer advised of any that are wrong, which he must correct. This is termed his second examination.

After this is done, he is subjected to a third examination, which is oral, lasting from four to six hours, on rules considered essential to safety of passengers and trains.

All station helpers and apprentice telegraphers from points along the system who have not previously been present on a similar occasion are brought to headquarters to listen to this oral examination. They hear the important rules explained, the questions, the answers, the comments, the important troubles which telegraphers have had on the road and throughout the country during the last fifteen years, the cause and remedy, and the general instructions which have been issued to guard against these troubles are related to them. No applicant, however, is assigned to duty as a telegrapher until, in addition to the foregoing, he has himself passed a satisfactory written and oral examination. The examination of the other man is for him simply a preparation. In this way he goes to work not as a green hand, but as one who has had fifteen years of experience.

After passing examination on rules, he is seated at the telegraph examination table, furnished with train order signal, train order manifold, carbon sheets and stylus, and

required to receive orders in regular form in accordance with the rules on which he has just passed examination, displaying his train order signal, giving the proper responses, repeating the orders, etc., and drilled in this way until he can handle the orders rapidly and correctly and without any prompting. This done, he is ready for duty. If he is to be an agent, or perform clerical work, or fill high position as a telegrapher, he is sent to the division superintendent for inspection that the latter may know him before he goes to work. Otherwise he is sent direct to the agent at the station at which he is to serve.

No one under twenty-one years of age is made an agent, and none are appointed telegraphers under eighteen years of age. If the position is one requiring bond, notice is immediately sent to the comptroller. In case of appointment to an important position as ticket agent or ticket seller, the approval of the general passenger agent is also obtained. Promotion to the position of agent is made from the ranks of telegraphers; when possible, competency being equal, preference is given to seniority of service. Train dispatchers are generally made by promoting telegraphers in train dispatcher's office. Candidates for telegraphers in dispatcher's office are selected from the best material on the division.

When an agent is desired for one of the larger stations the traffic department is conferred with.

In addition to the personal record blank, a service record is kept of every one connected with the telegraph and signal department from apprentice up, showing date of appointment, capacity, station, term of service, promotions, suspensions, errors, dismissals, etc. A telegrapher leaving

the service for any cause is given a service letter addressed to himself, stating the time and character of service and specifying the reason for leaving.

It takes from one to three days for a telegrapher to complete his examination. One day is sufficient for an experienced, energetic man. The average man consumes three days as follows:

First Day.—Three separate application blanks covering history for the last five years to be filled out. Examination on sight, hearing and colors. Examination as to telegraph proficiency. Learning the rules of the company as set forth in their rule book and special instructions.

Second Day.—Written examination, 198 questions to be answered in writing, answers to be read and corrected by examiner and a second written examination made of corrected answers.

Third Day.—Oral examination on rules, verbal instructions on the cause and prevention of railway accidents and drilling on the proper manner of handling train orders by telegraph, copying train orders on manifold, repeating them, displaying signals, etc.

It has been our experience that a man who has reached the age of eighteen, after having passed the required examination, is fully qualified to handle train orders. In proportion to the number of men employed over twenty-one, as against the same number between eighteen and twenty-one, the men over twenty-one are in the majority of those who have caused trouble in the operation of train movements.

The discipline of telegraphers is accomplished through the telegraph and signal department and the division offi-

cers. It is the duty of the traveling telegrapher to observe how all matters pertaining to the telegraph and signal service are being conducted, to see that all signal lamps and lenses are cared for in a way to obtain the best results. that blocking between adjoining stations by signalmen. keeping of block records, handling of train orders and block cards and operation of block signals is properly done, correcting and instructing those who need it and making regular and systematic inspection reports to headquarters covering each office within his district. It usually takes three days for operators coming from other railroads having similar rules to ours to qualify and get acquainted with our methods, requirements, etc.

Each agent, telegrapher, and apprentice telegrapher is furnished with a pamphlet entitled, "The Monitor," containing one hundred questions and answers bearing upon matters pertaining to passenger traffic, subjects which agents or their assistants are likely to meet with in the daily routine of business, and all are enjoined to thoroughly digest the information contained therein in order to handle these matters to the satisfaction of the department, as well as of the traveling public.

The main points covered being the proper routine of passengers, the reservation of sleeping car space, the various forms and classes of tickets to be used, the mileage to be computed and the proper checking of baggage.

It is our endeavor to educate the telegraphers in the manifold duties they have to perform with the view of promoting efficiency in the different departments and throwing open several avenues for promotion.

We give precedence to our employees and advance them as rapidly as their ability warrants and as opportunity affords, all of which conduces to good service, harmonious relations and a tendency to remain with our company.

The paper was received with applause.

President Chenery: Gentlemen, this paper is one of particular interest to us all. We know what we are up against. You know the necessity of educating our employees on the standard rules and method of operation. Before entering upon a discussion of it, it seems fitting that a vote of thanks be tendered Mr. Hope for his valuable paper.

Mr. Davis moved that the thanks of the association be tendered Mr. Hope, and the paper be printed in the minutes.

Which was seconded.

And agreed to.

Mr. Selden: This paper presents the most full and complete idea of an examination that I have yet met with. I think it well, perchance, to name what we do on our particular line. We have what we call a catechism in which is embodied questions pertaining to the rules in force. I would have brought some with me, but the fact that we are just finishing a new set of block rules and changing our rules somewhat gave rise to some questions that had not existed before. However, I will say to the gentlemen that when they are printed so as to meet the requirements I will be glad to receive any requests and will see that they get a copy of the rules.

I note that Mr. Hope states that they promote telegraphers in the train despatcher's office. On the B. & O. we promote the copying operator. And I am a great be-

liever in copying operators. You are at times short of good despatchers. One trouble I find with superintendents on all the railroads with which I am acquainted has been that when there is a spasm of economy it strikes the copying operator. I think if that were the last place to economize it would be a good thing. I do not think you can give the train despatcher any too much help.

We have a card record. There is a card sent to my office giving the name, whether married or single and recommendations. Every time that man is reported his card comes in. If suspended I will know the cause. I have a complete record whether he be on one division, or two, or three, or four, as the case may be. We find it of great advantage.

The discipline of telegraphers is accomplished through division officers. We have no traveling telegrapher as such. We tried for a long time to have the train despatcher become, also, division operator, his title to be division operator and have charge of the despatchers. But we found his time was so occupied in despatching duties that the telegraph necessarily did not receive his first attention. We have recently a division operator who reports to the superintendent of the division and the superintendent of telegraph, who is appointed by the division superintendent with the concurrence of the superintendent of telegraph. He is enabled to get all over the division and visit personally every office, and it is required of him to make, upon a form, a report of the condition of each office, not in a general way, but specifically. The columns of the report are arranged, condition of battery, cleanliness of office, condition of materials, supplies, lenses, etc.

We do not take as much time in the examination of telegraphers as called for in the paper. Not because we would not like to, but because we haven't the opportunity. More than that I will say that we do not permit men to work until they have been placed in the office for a certain length of time and performed the duties they will be required to do. And I want to say to those who have employed as we do fourteen to eighteen hundred telegraphers, it is economy in every way to have efficient operators, reporting both to the division superintendent and to the superintendent of telegraph so that the latter may be in touch with the entire department all over the system.

Mr. Rhoads: There are one or two thoughts that come to me in addition to what is specifically mentioned in the paper, and one is with reference to commercial work of railroad companies. I take it for granted almost every road here represented handles commercial business at their various offices.

We have a great deal of trouble in getting efficient reports as the chief despatcher's don't take proper care in seeing that operators are instructed in this feature of the work. I think Mr. Hope's road is to be congratulated upon giving as much attention as they do to the examinations. I was asked to take part in the discussion of the paper, but it is gone over so thoroughly it don't seem to need much discussion. Some of the boys may call this a pipe dream. I did not know they were doing all this but am assured by Mr. Hope it is a fact. Mr. Hope's having, also, the signal department, shows where his gray hairs are coming from.

One thing spoken of by Mr. Selden I think is important.

Ten years ago a copier was thought a necessary luxury. Every one who has had experience in the despatcher's office knows it is a hard matter for an operator to get all his message work done and all that is required of him, and pay very much attention to what the despatcher is doing. He has no opportunity to even talk to the despatcher. I am sorry to say our company has done away with copiers. It is of great assistance for a despatcher to have a copier, while on the other hand I can cite some instances where the despatcher prefers to copy his own orders.

Mr. Williams: In glancing over papers read in former convention of the character just submitted I note with astonishment the small number on this pivotal subject. All superintendents of telegraph do not employ all telegraphers directly for their railroads, but all superintendents do have an interest, more or less, in doing so. I am convinced that if this association required a portion of its time to be devoted to this vital question at every convention, paper or no paper on the subject, we would find an increased interest and better attendance. Superintendents could not afford to be absent and I am quite sure deliberations along these lines would please our general managers as it strikes the kernel.

The subject before us is of especial interest and apropos just at this time in view of recent legislation requiring augmentation in the forces handling traffic over our railroads, especially telegraphers, after March 1st next. The ideal condition as outlined by Mr. Hope is desirable, but just now is not practicable with us in the south. We realize and appreciate that something in this direction is necessary, but we have not men on the waiting list as appears to be

the case, as outlined. Our ranks are being depleted constantly by those most desirable leaving for occupations holding out greater inducements, and it is a question with us how the vacancies and the new positions are to be filled.

It was thoughtful of the president to have copies of papers to be read sent out in advance that we might give them the careful consideration their importance demands. Having a copy of Mr. Hope's paper in hand has enabled me to discuss its merits with some of our management to evolve ideas pro and con. I have had many questions propounded and have tabulated a few. I will read them and will be pleased for Mr. Hope to enlighten us.

What is the maximum and minimum of pay?

Mr. Hope: \$52.00 to \$90.00.

Mr. Williams: What are the hours worked by telegraphers?

Mr. Hope: Eleven hours.

Mr. Williams: Are the operators organized?

Mr. Hope: Yes.

Mr. Williams: Do the operators teach telegraphy?

Mr. Hope: Not required to, but do in some cases.

Mr. Williams: Is the system of teaching operators in telegraph offices maintained by the railroad?

Mr. Hope: Yes.

Mr. Williams: Are the applications for positions of telegraphers received from men along the line or from other roads?

Mr. Hope: Along the line and from other roads.

Mr. Williams: If an applicant fails after the third day

of examination, does he receive any recompense from the railroad company for the time he has put in in being examined?

Mr. Hope: If we do not discover that he may not be competent before any such length of time, he is paid for two or three days' services.

Mr. Williams: It would appear from the paper that you have on hand a number of applicants who have passed the examinations and were ready to step into an opening; are these men so held under pay?

Mr. Hope: Yes; in most cases as helpers, clerks, and messengers.

Mr. Williams: Do you have any trouble in getting applicants to come to your office for examination?

Mr. Hope: No.

Mr. Selden: There is one feature we adopted some time ago which we termed "regular extra operator." The general manager gave us authority to place certain operators in "regular extra" positions on each division. This meant that a man would not have to take just what extras he could get, but would get regular pay. Outside of this we have what we know as extra men who get as much work as we can give them. But the "regular extras" have regular pay.

Mr. Taylor: The points in the paper are complete and have been pretty thoroughly discussed. There are one or two things I want to ask information on. I notice Mr. Hope states, ten per cent. of the applicants are disqualified on account of defective eyesight; three per cent. on account of defective hearing, and six per cent. on account of defective color perception. Is that a pretty fair average, generally speaking?

Mr. Hope: My chief operator says that is about right—ten per cent.

Secretary Drew: I want to ask if it is allowable to remedy that defect by the use of spectacles?

Mr. Hope: We have tried quite a number and helped them out.

Secretary Drew: You allow them to use glasses?

Mr. Hope: Yes, sir.

Secretary Drew: Very much to my surprise I found the examining surgeon of our road was rejecting men simply because they came to him with glasses. I immediately protested against such an antiquated notion as that, that a man was unfitted to be a telegraph operator because he used glasses to aid his sight. I think that has been remedied so far as our road is concerned.

Mr. Hope: We are not hunting for men with glasses, but you will find quite a number of the men are men of some years and all wearing glasses.

Mr. Taylor: There is one other point that interested me, and that is his statement that in proportion to the number of men employed over twenty-one as against the same number between eighteen and twenty-one, the men over twenty-one are in the majority of those who have caused trouble in the operation of train movements. It has been my experience that a hard and fast regulation that a man must be of so many years of age is unnecessary and is injurious to the service. There are many operators twenty years of age that are safe.

Mr. Ryder: This paper deals largely, of course, with the early education and examination of the operator,

but little has been said about his education after he is employed on the road. But isn't that where more work should be done than has been done so far as the railroads of the country are concerned? I believe a good deal of the trouble that has been experienced has developed after the men were on the pay-roll. That is being recognized apparently more and more. I believe that is a great big factor in the proposition at present.

Mr. Selden: A division operator should be a first-class train despatcher—born out of a train despatcher's office. This gets rid of some of the trouble we used to have in the old days when a division operator was not a despatcher. He did not seem to have the same weight with the superintendent as though he had been a despatcher. Frequently a despatcher would say he could not get along with certain operators and that would keep your division operator quite busy in selecting other people. But we are fixed now so if a despatcher makes a complaint of that character we can show the superintendent whether our trouble is with the operator or despatcher.

President Chenery: There is certainly a great deal of meat in this paper.

Mr. Rhoads: There is one point passed over lightly, and that is relative to the sight examination. I think the way it was left the feeling was in favor of looking upon it in a light manner. It occurs to me that is quite an important feature and one of the important details of the service. A gentleman came to my office and had his son, an intelligent young man, with him. This gentleman said he understood his son after completing his education in telegraphy could not procure a position on account of hav-

ing to wear glasses. I thought it an opportunity to make a test case and he was ruled out. The general superintendent asked if he would be able to see the markers on a train if he were without his glasses and he admitted he could not. He says: "Suppose you were at work at night in a telegraph office and you mislaid your glasses or broke them, you admit you could not see the signals until you were able to procure another set of spectacles?" That threw a new light on the question, and I think that is one of the points to be taken into consideration. It would be well to bring this to the attention of the men who are running these telegraph schools, to be sure in taking in students to take in men with first-class eye-sight. It is important.

President Chenery: An invitation has been extended by Mr. Griffith to visit the school where telegraphy is taught at Elmira, N. Y. I would suggest it would be well for those gentlemen who can to see Mr. Griffith at our noon recess so he may have some idea of how many would like to avail themselves of this opportunity. We are all up against the proposition and will be so more than ever within the next nine months. The school at Elmira, I understand, is one of the most up-to-date schools, that has recognition by the railroads—or by a railroad.

Mr. Selden moved the thanks of the association be tendered Mr. Griffith for the invitation and the members avail themselves of the opportunity,

Which was seconded,

And agreed to.

President Chenery: Before proceeding to the next paper, the Secretary has some telegrams and communications that perhaps it would be well to read at this time.

Secretary Drew read the following:

Chattanooga, Tenn., May 4, 1907.

P. W. Drew, Secy. Ass'n Ry. Tel. Supts.

Dear Mr. Drew: As I am out of telegraph service. I cannot retain my membership in the association. Will you kindly have my name transferred to proper list. I do not expect to attend the June meeting, but hope to meet you at the Jamestown Exposition.

Yours sincerely,

G. L. LANG.

Jackson, Tenn., June 18, 1907.

P. W. Drew, Secy. Ass'n Ry. Tel. Supts., Atlantic City, N. J.

Sorry I cannot be with you, but hope the meeting will be of unusual benefit to our cause and all present will have an enjoyable time.

E. E. TORREY.

Chicago, Ill., June 18, 1907.

P. W. Drew, Secy. Ass'n of Ry. Tel. Supts.

Will arrive Atlantic City about 11:00 A. M. Thursday. Please tell Mr. Ashald and Mr. Griffith.

G. W. DAILEY.

The Ass'n of Ry. Tel. Supts., Mr. E. A. Chenery, Pres..

Marlborough-Blenheim Hotel, Atlantic City, N. J.

Dear Sir:—The American Telephone and Telegraph Company and The Delaware and Atlantic Telegraph and Telephone Company take pleasure in extending the courtesies of their lines, between the hours of 6 P. M. and 9 A. M., to the members of your Association during its meeting at Atlantic City, June 19th and 20th, 1907.

The service will be rendered from the pay station located in the Marlborough-Blenheim Hotel, and members desiring

to use same are requested to show their badges to the operator as a means of identification. Yours very truly,

P. W. MILLER,

Division Agent Railway Department.

Secretary Drew: We haven't received anything from the W. U. T. Co., but I have no doubt but what as usual they extend their courtesies to us if we want to do any social telegraphing.

Mr. Griffith moved the thanks of the association be tendered for courtesies extended.

Which was seconded,

And agreed to.

President Chenery: As we have to meet at 2 o'clock for the photographer, it might be well for us to adjourn for luncheon.

Mr. Selden moved the convention adjourn,

Which was seconded.

And agreed to.

FIRST DAY—AFTERNOON SESSION.

(Wednesday, June 19, 1907.)

The convention was called to order by President Chenery at 2:30 o'clock P. M.

Secretary Drew read the following telegrams:

New Haven, Conn., June 19, 1907.

P. W. Drew, Blenheim Hotel.

Owing to important matters which have just arisen, I regret once more inability to attend the convention; very much disappointed as I fully intended to be present. I hope

the convention may be very enjoyable as well as profitable to all concerned.

N. E. SMITH,
Supt. of Tel.

Englewood, Ill., June 18, 1907.

P. W. Drew, Secy. Ass'n Ry. Tel. Supts.

Greeting to all. Wish you a successful meeting.

W. J. HOLTON.

Atlanta, Ga., June 18, 1907.

E. A. Chenery, Pres. Ass'n Ry. Tel. Supts.

I regret exceedingly my inability to be with you to-day; hope you will all have a good time.

J. LEVIN.

Chicago, Ill., June 19, 1907.

E. Chenery, Pres.

Regret very much that I am unable to attend. Wish you a prosperous meeting.

F. H. VAN ETTEN.

New York, June 18, 1907.

Mr. P. W. Drew, Secy. Ass'n of Ry. Tel. Supts.

Dear Mr. Drew: At the last moment I find that Mrs. F. and I cannot attend the meeting this week on account of the serious illness of my sister. We had looked forward with considerable pleasure to the meeting this year and regret very much that we cannot be with you. Wish you all a good time and an interesting meeting. With kind regards to all.

Very respectfully,

L. B. FOLEY.

Chicago, Ill., June 19, 1907.

P. W. Drew.

Best wishes for successful meeting. Remember me kindly to all.

F. F. FOWLE.

Secretary Drew: We are always glad to interrupt the proceedings at any time to present the names of our friends. I wish to present for membership J. B. Fisher, Superintendent of Telegraph, Penna. R. R., Philadelphia; G. A. Dornberg, Chief Lineman, Penna. Lines, west, Pittsburg; E. A. Patterson, Asst. Supt. Telegraph, C. M. & St. P., Milwaukee; and associate member, R. D. Brixey, New York.

I move that these gentlemen be declared elected,

Which was seconded.

And agreed to.

President Chenery: I wish to speak of the souvenir that has been distributed to the members by the American Tel. & Tel. Co. It is an American standard wire gauge, something that will be found to be very useful. In connection with this the representative of the company has asked me to say that the leather case which was to accompany this gauge was not completed in time, but it is to be manufactured and will be mailed to the members, so you will have the case and the gauge complete.

President Chenery: Next in order will be the reading of papers. I would suggest, as we have had "Education of Telegraphers in Railroad Work," it might not be out of line if we take up the paper, entitled, "The Superintendent of Telegraph; What He is vs. What He is Not." Mr. Bentley is not present and I will ask Mr. John L. Davis to read the paper.

Mr. Davis read the following paper:

St. Louis, June 5, 1907.

Mr. A. B. Taylor, Supt. Tel. N. Y. C. & H. R. R.,

New York, N. Y.

Dear Sir: In response to your favor of March 13, file

2417, I am sending you with this a copy of paper to be presented at the Atlantic City convention this month. By direction of President Chenery, I have furnished copies to the gentlemen appointed to discuss the paper. I am sorry that it was impossible for me to turn the paper out sooner, but trust that it will still be available to you at this late date.

Respectfully,

F. E. BENTLEY,

Supt. Telegraph.

THE SUPERINTENDENT OF TELEGRAPHY.

What He is Versus What He is Not.

At the time that the subject of this paper was first selected, I thought it an easy matter to trace back to the origin of the telegraph for its history, and that it would be even a less difficult task to look up the experience of former Telegraph Superintendents, to determine by precedent just what the office was intended to be and the functions that it should cover. It appeared to be especially easy to learn of the Railway Telegraph Superintendent, since the history of the past short century must have included the experience of them all.

My purpose at the start was in line with the endeavor of others before me, to suggest ways and means of standardizing, and show the advantage of having the functions of that office well defined and made uniform, in comparison with the seemingly diversified duties now involved. But at every step in my investigation, I saw the futility of such an attempt, and was finally forced to the conclusion that so long as the title "Superintendent of Telegraph" is assigned to man, his duties will be too numerous to mention

and the scope of his achievement be bounded only by his ambition.

I shall take the liberty to digress from the main question, and simply give some views, more or less seriously, that I have acquired in my short experience, thereby at least affording the gentlemen appointed to lead the discussion some opportunities to separate flaws from facts.

The term "telegraph," I found, applies to a multitude of contrivances, the electrical telegraph being most generally used and probably, therefore, the best known application. The word is of Greek origin, meaning "to write afar off." Some authorities say that the ancient Greeks first employed telegraphic methods, and that the semaphore, the word meaning "sign-bearer," was the one which they most used. This system was widely copied by all nations and is in practical use to-day by almost every railroad on earth. Other historians credit the Chinese with the first mechanical telegraph invention.

Whatever or whenever may have been the origination of the telegraph, its application in one way or another dates back to the beginning of time.

God telegraphed the thought that made the world. He was, therefore, not only the first telegrapher, but superintended the job.

Adam and Eve also did a turn at telegraphing, when, like most telegraphers, they were still young and full of innocence. One telegraphed the other some glances which were answered so quickly that mankind has been sorry ever since.

Explorers of uncivilized countries report that savages telegraph by placing members of the tribe in a line on top

of adjacent hills, to beat signals on drums to each other. If the distance is too great for the sound to carry, they use visible signals of various kinds.

Almost as crude a system was used in this country during the War of Independence. It was called Washington's telegraph, presumably because of its having been used in his time. A portable mast, with a tub or barrel on top, a movable flag on one side and a basket suspended from the other side, made a combination by which about sixty different signals could be displayed.

No earlier than the year 1825, inventions along the line of electric telegraph were practically stopped by the positive declaration of a prominent European investigator that the project of an electro-magnetic telegraph could not possibly be successful. All of us have a good idea of what has actually occurred in that line since.

A German inventor recently succeeded in telegraphing a portrait over more than one thousand miles of wire, within eighteen minutes' time, and expects to soon overcome the high resistance of submarine cables, so that a photograph may be sent from London to New York in twelve minutes.

Not long in the future, a typewriter operator will doubtless be able to send messages any distance with great rapidity and print them in plain English at the receiving end.

The wonderful progress in telephone invention justifies the prophecy that we shall soon see a life-likeness of the person with whom we talk at any distance.

From the earliest crude systems to the present, changes in form and usage have been numerous and frequent. At no time has any method been entirely adequate for the purpose designed. No sooner is an improved device put into

commercial use than its capacity becomes overcrowded, if it is at all practical. This is especially true in the present period of prosperity.

Makers of equipment hesitate to standardize parts of apparatus, for fear that some new improvement will change their plans before the pieces can be turned out of the shop. Most users of equipment are slow at installing new inventions, evidently anticipating that something more adequate and less expensive will soon be devised, or that slump in business will occur, making improvements unnecessary.

In recent years a growing spirit of antagonism has shown itself by the passage of radical laws in various states, which seriously affect the operation of railroad and telegraph companies, and serve to further slow up the expansion of lines, as well as the adoption of new improvements.

As the telegraph has been and will be used in its many forms, so must the Telegraph Superintendent keep abreast of its progress, but in the stress of present conditions, I conclude that he is primarily a censor, not only of traffic handled, but of the manner and methods of handling it.

Telegraph traffic is peculiar and various. Wire telegrams probably constitute the greater part of it and deserve closest attention.

A message of any kind should be transmitted from sender to addressee in the quickest possible time and in the most intelligible way. It is the censor's duty to see that this is done.

Writers of telegrams are largely responsible for congestion of wires and consequent delay to their business. They route messages over the wire, when the mail would do as well, and make little or no effort to abbreviate their

language; but do not hesitate to complain of poor telegraph service if their wired "letters" are delayed. The censor may effect a partial remedy by diplomatic persuasion.

I believe a system of coupons or stamps, good for so many messages containing so many words each, to be issued by the general manager or general superintendent, to the head of each department that has occasion to send telegrams, would serve to curtail telegraphing within proper bounds. Routing of telegrams over wires that are less burdensome than others figures considerably in their prompt handling, and criticism by the chief in charge of this feature should be encouraged.

The telephone service also needs constant censoring, for the double reason that equipment is more expensive, and easily accessible for those to whom "talk is cheap." The telegraph censor will probably find that the best means of checking telephone use is to have a record kept of stations or lines that are often reported busy, and get after the persons who use those lines to cut short their talk.

In both the telegraph and telephone service the censor must also wield his sceptre to keep the operating force in line. Unfortunately, the talent needed for this work seems to abound mostly in other trades and professions. The majority of those who do learn the business are content to perform mechanically the work put before them, without thought of excelling; hence it is left to the censor to select those in whom he may see the latent fires of ambition and then to light and keep the flame ablaze. Probably the surest way of doing this is by judicious promotion, and, in the process of training, to give the young worker to understand that it is up to him to secure promotion by making himself competent for a better position.

Along with the Morse telegraph and the telephone there are the signal systems,—interlocking, train order and automatic block, also the telautograph, bulletin board and time clock, all of which properly belong to the telegraph class, although on many railroads these systems are, because of expediency, supervised by other departments.

Telegraph contracts, construction, equipment and maintenance alike come in for censor under the telegraph department head. We should, therefore, have a thorough knowledge of every detail, and be able to foresee the effect of development in the future.

Blackstone says of the best lawyer, "It is not the one who knows the law, but he who knows where to find it." In a great measure, it is so with the Telegraph Superintendent: He should know what is good for the life and welfare of his department, where to find it and how to bring it in to the best advantage.

So much for what, in my opinion, the Telegraph Superintendent is or should be.

I shall rely on my colleagues appointed to discuss the question to lay bare the other side, for in my sight, the Telegraph Superintendent is all right, excepting that he is not very numerous, when known under that title alone.

Current official lists show there are more than one thousand railway companies in the United States, Canada and Mexico. The official roster shows the title "Superintendent of Telegraph" less than one hundred times. In many instances, this title is given in combination, adding "Superintendent of Signals, Car Service, Mail, Trainmaster, Chief Despatcher," etc.

But the very nature of the work on every railroad of any consequence, requires the use of the telegraph in some form or other, which must need supervision. It is plain, therefore, that on most roads the Telegraph Superintendent is there, but "unknown, unhonored and unsung." Also that this phase of railroad work is not carried on with sufficient aggressiveness, begotten of persistence and hard liks, to enlarge the field in that line and justify a distinctive title for the one responsible in handling it.

Believing as I do that much good is accomplished by the Association of Railway Telegraph Superintendents in diffusing knowledge which is helpful to all engaged in such work, I suggest that the Secretary be delegated to petition for membership, the trainmaster or chief dispatcher of those railways that do not show in their official roster the title of Superintendent of Telegraph.

The paper was received with applause.

President Chenery: The superintendent of telegraph is becoming more numerous in this association, as our membership list will show. We have at this meeting added fifteen new members, the largest addition ever made in the history of the organization.

Mr. Rhoads moved the paper be received, discussed and spread upon the minutes.

Which was seconded.

And agreed to.

President Chenery: The paper is open, as are all others, for discussion, and the chair will be glad to hear from some member.

Mr. Selden: What he is, is a pretty hard thing to say; what he is not, is still harder. Some superintendents have

said they would not think of suggesting things to their general managers. I think one of the principal troubles with the superintendents has been their extreme modesty. The duties of the superintendents vary on the different systems, of course. Some systems are small lines comparatively and do not have the duties to perform that superintendents on the larger ones do. It would be a hard thing to standardize.

Mr. Davis: I think, speaking broadly, that the superintendents of telegraph who are active members of our association represent something like 128,000 miles of railroad. Now, by taking the Railway Guide and checking the names of the roads which show the title of superintendent of telegraph, and by taking the number of wires per mile on the road I have the honor to represent as a basis for calculation, we can safely presume that our active members are held responsible for enough telegraph wire to encircle the globe thirty-eight and one-half times. Now, if it were not for that wire the commerce of this country would undoubtedly come to a standstill. And if we give the superintendent of telegraph credit for keeping these wires in working order, he must, also, at least be given some credit for keeping commerce and traffic moving, and I believe after all that we are really of some importance.

Mr. Groce: I cannot add anything to what has been said. The telegraph department is of importance, but we should not have swelled heads. The standardizing of the position of superintendent of telegraph I hardly imagine can be carried out in the United States. The different contracts between the telegraph companies and the railroad companies could hardly be standardized. It would be almost useless

to talk of anything of that kind. But, I believe there is a tendency now for the railroad companies to pay more attention to the telegraph department and to the suggestions of the superintendent of telegraph. The signal end is becoming so important, and within the next few years it will be largely forced upon the telegraph department. In some cases the superintendent of telegraph can fill two positions very well. There has been a tendency to couple the engineering department and the signal department, and I believe the signal and transportation departments, but I believe it would be better to have the signals under the superintendent of telegraph.

Secretary Drew: I am pleased to see Mr. Sperry with us. Some years ago he was with us at one of our meetings, when we were struggling along financially and were barely able to win out, being some fifty, sixty or seventy dollars behind. Mr. Sperry came to me and says: "Drew, why don't you put a few advertisements in your minutes. You can get advertisements in there that will help support your association." On that suggestion and by his encouragement we adopted that plan after the Omaha meeting, and you see the results, for the treasurer's report to-day shows instead of sixty or seventy dollars behind, ninety dollars ahead. And a great deal of that credit is due to Mr. Sperry and the suggestion that he made.

President Chenery: We are certainly glad to have Mr. Sperry with us. His suggestions at all times are valuable.

Mr. Sperry: Thank you.

Mr. Rhoads: There is one thought comes to me that is sometimes lost sight of, and that is, I presume almost every man here, who as a telegraph superintendent represents two

corporations, the railway company and the Western Union Telegraph Company, and my observation has been sometimes, not only with the road I represent, but some of our neighbors, that some of our usefulness—what might be our usefulness—for one corporation or the other has been lost sight of because of the tendency of a great many railroad officials to look upon us as one-sided. Where one furnishes the material and the other the labor to put the material in actual service we have to be thoroughly impartial in our dealings with corporations.

At to what a superintendent is and what he is not, he might be compared to a Jersey sweet potato. I have for a good many years traveled around the country, from the Great Lakes to Florida, from Boston to San Francisco, and wherever I would see sweet potatoes they would invariably tell us they grew in Jersey. Yesterday in coming here from New York I said to my wife: "You can feast your eyes on Jersey sweet potatoes. You won't see anything but sweet potatoes from here to Atlantic City." When we got here I asked her if she observed the sweet potato hills. She said: "Sweet potatoes must grow on pine trees." So it is with us, I think, sometimes we are what we are not and we are not what we are.

(Laughter.)

President Chenery: We have with us Mr. John B. Taylor, of the General Electric Company. Mr. Taylor has very kindly consented to prepare a paper on inductive disturbance to telegraph wires caused by high tension lines paralleling railroad right-of-way. The recent legislature of Arkansas passed a law granting power distributing companies, for public uses, the right to use the railway com-

panies' right-of-way for their poles and wires. The bill became a law, I assume, before the legal department of the several railroads fully realized the importance of it. I was requested to secure information from the various telegraph superintendents as to what effect high tension wires paralleling the right-of-way would have as to danger to life and property and the effect upon telegraph and telephone service. This, as I remember, was suggested by Mr. Griffith. Mr. Taylor has consented to favor us with a talk on the subject. I have pleasure in introducing Mr. John B. Taylor, of the General Electric Company.

INDUCTIVE DISTURBANCES TO TELEGRAPH LINES.

By John B. Taylor.

Due to the current flowing in any wire, there is an electro-magnetic field surrounding this wire extending to an indefinite distance, and gradually decreasing in strength. If the current in the conductor is alternating, the strength of this field is continually changing, and it is this change which induces electromotive forces in any conductors which chance to be in the field.

Due to the e.m.f., or voltage on the conductor, there is an electrostatic field extending from the conductor to an indefinite distance and decreasing in strength with increased distance. This electrostatic field attracts charges in neighboring conductors, so that in general there is an alternating current in any neighboring circuit as the result of both electrostatic and electromagnetic induction.

These electrostatic and electromagnetic fields exist about the wires of direct current systems, as well as alternating

current systems; but it is only the changing strength of these fields which induces disturbing currents in neighboring wires; in other words, a wire has induced in it an electromotive force proportional to the rate at which the strength of the electromagnetic field changes, and, similarly, charging currents flow in and out of a wire proportional to the rate at which the electrostatic field changes. For this reason inductive disturbances are always of an alternating character, although we may have inductive disturbances from a direct current system where the value of the current changes rapidly.

Considering the matter then from merely the mathematical and physical standpoint, any conductor wherever placed will have currents induced in it as a result of currents in other circuits, no matter what distance there may be between them. From the practical point of view, however, it is only when the magnitude of these induced currents is sufficient to cause interruption or inconvenience to the regular operation of the circuits that they are classed as "disturbances." Disturbance, therefore, is an entirely comparative term, and depends quite as much on the apparatus and conditions of operation on the disturbed circuit as on the circuit, which is ordinarily blamed for the trouble. In other words, a 60,000 volt transmission line, conveying thousands of kilowatts, just as certainly has currents induced in it from a neighboring telegraph line as the telegraph line has currents induced in it from the power transmission line. However, the extra currents in the transmission line as a result of the working telegraph line, are not classed as disturbances, and are, therefore, ordinarily and properly overlooked.

The direction of the electromagnetic stress about a conductor carrying current changes with the direction of the current, so that if we have two wires close together which carry equal currents, but in opposite direction, the field, due to current in one of these conductors will, at a slight distance from the wires, be practically neutralized by the field of opposite direction, due to current in the other wires; and, similarly, electrostatic field, due to one wire at a certain voltage, will be practically neutralized if there is a second wire close to it at the same voltage, but of opposite polarity. The neutralization will be more nearly exact the closer together the two conductors. Similarly, the two sides of a metallic circuit in a disturbing field act in opposition, and if sufficiently close together practical neutralization may result, even though the two conductors are in a very strong field. The final resulting disturbance in any telegraph, or other circuit is, therefore, the residual after taking into account the effect on each side of the circuit of all neighboring wires carrying current at their different voltages from the circuit under consideration.

From consideration of these facts we can see that it is possible for the telegraph, and the more sensitive telephone circuit, to run for miles in fairly close proximity to transmission circuits operating as high as ten, twenty, thirty, or even sixty thousand volts, and carrying currents up into the hundreds of amperes. This is because the transmission system is balanced; i. e., for every ampere in any conductor of the transmission system there is a corresponding ampere in another conductor flowing in the opposite direction, and similarly, for the electrostatic field of one sign on or near the conductor there is a corresponding field of opposite sign on other conductors. On transmission sys-

tems, however, this condition holds only so long as everything is normal. An accidental ground on one of the conductors of the transmission system will disturb the electrostatic balance, and a broken conductor, or other unusual condition may disturb the electromagnetic balance, usually by allowing some of the current to return by way of the earth.

Consideration of these facts will show that the most favorable condition for sensitive telephone or telegraph systems in proximity to power systems is to have both systems operated on metallic circuit with outgoing and return conductors of each circuit as close together as possible, as in such a case the strength of field is a minimum and the two sides of the signaling circuit effect still further neutralization. Such extreme neutralization is usually necessary only for the very sensitive telephone.

The most unfavorable condition is where the outgoing and return conductors of power and signaling systems are widely separated, and a practical case of this unfavorable condition is where both power and signaling circuits operate with ground return. The distance between the two sides of the circuit in such a case is at least that between the cross arm and ground, and practically much greater than this, due to the fact that the return current does not flow entirely in the surface of the ground immediately following the route of the pole line.

In practice it is not desirable, for mechanical reasons, to place open air signaling wires closer than ten or twelve inches apart, and the separation of conductors on power transmission circuits may be as much as six or seven feet when the voltage is as high as, say, 60,000 volts. It is,

therefore, always advisable to make transpositions of the conductors forming a metallic circuit system, such transpositions being so located that, considering a given length of line, the average distance of any conductor from all other conductors will be the same. A two-wire metallic circuit transposition involves merely interchanging the positions of the two wires at the regular or proper intervals; while on a three-phase transmission line the three conductors, which are usually on triangular spacing, are spiralled one-third of a turn. A complete transposition section usually consists of three equal lengths of line, with a one-third spiral at two points. Many transmission systems have none of these transpositions, as there is little benefit to be derived from them unless telephone or telegraph lines are in close proximity. Where a system operates with ground return it is obviously impossible to make use of any form of transposition.

I have so many times been confronted with the question. "How far must a telephone or telegraph line be removed from an alternating-current system to be free from disturbances," that I anticipate the same question, possibly slightly disguised, at this meeting. There are so many different factors that it is impossible to make any general reply. Some of the points having direct bearing on this question of inductive disturbance are the following: (1) Voltage of power system; (2) current in power system; (3) frequency of power system; (4) distance power line to telegraph line, distance power line to ground, and distance telegraph line to ground; (5) length of telegraph line parallel to power line; (6) total length of telegraph line; (7) length of cables (overhead or underground); (8) number of telegraph wires on pole; (9) telegraph system: single, duplex, quadruplex.

printing, high-speed automatic, etc.; (10) number and resistance of relays in circuit; (11) telegraph working current.

Taking up these various points separately:

(1) Electrostatic induction will be greater the higher the voltage of the power system.

(2) Electromagnetic induction will be greater the greater the current in the wires of the power system.

(3) The electromagnetically induced voltage and the electrostatically induced charging current will be directly proportional to the frequency of the power system; that is, the values will be approximately two and one-half times as great for a sixty-cycle system as for a twenty-five-cycle system. This, however, is not a direct measure of the disturbance to telegraphic apparatus, as a number of the other factors tend to give less disturbance as the frequency increases.

(4) The distance between the wires of the circuits and ground are usually the factors which give the greatest difficulty in figuring or predicting the amount of disturbance that is likely to be experienced in any case. In the field these distances vary from one mile to the next, and frequently from pole to pole. Increased separation between power line and telegraph line reduces the inductive effects in general more rapidly than increase of distance: that is to say, a separation of twenty feet will reduce the disturbance to less than half the disturbance at ten feet separation. The closer the wires are to ground the less will be the electrostatic disturbance. The difficulty of any exact calculations, even where the separation is uniform, lies in the fact stated previously, that return current does not flow

in the surface of the ground directly beneath the wires.

(5) The greater the length of telegraph line exposed to power line the greater will be the inductive disturbance. Other things being equal, an exposure of twenty miles will cause twice the disturbing current, both electrostatic and electromagnetic, as an exposure of ten miles.

(6) Disturbance also depends on the total length of the line: e. g., a line 100 miles long, with a ten mile exposure, will not feel the disturbance as much as a ten mile line, the entire length of which is exposed. This is because the longer line will have greater resistance, and the electromagnetically induced voltage will not cause as much alternating current to flow through the instruments as the same induced voltage in a shorter line. Also, the capacity to ground of that portion of the telegraph line outside of the disturbing field will furnish some of the charging current caused by electrostatic induction, so that less charging current will flow through the instruments at the end of the line.

(7) Underground cables, or those with metallic sheaths, have a much greater capacity than open wires, so that sections of cable may cause marked modifications in effect of electrostatic induction.

(8) In general, the disturbance to an individual wire will not be so great where there are a number of lines on the same pole, since the wires tend to shield each other to a greater or less extent: e. g., considering only two wires on a pole, the current induced in one of these wires through proximity to power line sets up its own field in opposition to the field from the power wire, and, similarly, the electrostatic charge attracted by electrostatic induction to one

wire also exerts a shielding or neutralizing action for the other wire.

(9) It should be obvious that the various types of relays used in single wires, duplex, quadruplex, printing, high speed automatic, etc., will have widely different sensibilities to superimposed alternating currents.

(10) A line having a number of way stations, with 150 ohm relays, all in series will present a much higher impedance to the flow of induced alternating current than a line with but two terminal stations; and assuming that working current is the same in both cases, the disturbance will be felt less on the line having the greater number of stations. This effect is more marked than might appear at first sight, since the standard 150 ohm relay chokes back 25-cycle alternating current as though its resistance were approximately 500 ohms, while the same relay at 60 cycles has a choking effect equivalent to 1,200 ohms. These figures can be taken as only approximate, since much depends on the air gap adjustment of the relay, as well as the number of turns and on the size and magnetic condition of the iron core.

(11) The disturbance due to a given induced current will be less as the direct working current is increased, since it is the percentage variation between the maximum and minimum values of current which determines the chattering of the relay.

In order to prevent disturbance of telegraph lines as a result of exposure to alternating current systems, we have three general lines of attack: (a) Increased separation; (b) special telegraph instruments not sensitive to alternating current, and (c) neutralization.

(a) Increasing the distance is obviously so simple a remedy as to require little discussion. Unfortunately this may involve difficulties in obtaining new right of way and expenditure of large sums of money in the case of existing lines; but should be kept in mind when constructing new lines.

(b) Where the disturbance is not extremely bad, several means may be employed to reduce the effect of the alternating current. As stated previously, the proportion of superimposed alternating current to the normal working direct current is a measure of the disturbance, so that increasing the normal working current in the line will, in general, help matters. Also, since alternating currents do not pass readily through reactive coils, increasing the reactance of the line by inserting in series coils wound on iron will tend to reduce the disturbance. Also, condensers may be used, which allow the alternating current to pass; but which do not pass the direct current. Thus, a relay shunted by sufficient capacity will separate the two currents, the direct going through the relay and the alternating through the condenser. Both of these methods will tend to make the line sluggish and may fail where high speed automatic, or machine transmission is employed, since in these cases the frequency of interruptions or reversals in the telegraph circuit may be as great, or even much greater, than the frequencies of the commercial alternating current systems. The back contact relay, with reversing sounder, or what is known as the "bug trap" device, may also be of service in some cases. There have also been proposed various methods of neutralizing, or absorbing, the effect of alternating current in the relay itself. All of the

devices in this class must be considered as palliative rather than curative remedies.

(c) Neutralizing may be accomplished either in the power line, the telegraph line, or in both together. In its simplest form this means metallic circuit for either the power line or telegraph line. Where expense, or other conditions prevent the installation of metallic circuit, various neutralizing connections may be employed. These will divide into two general classes:

First: Those in which the fields of the disturbing power wires are neutralized by other wires, and

Second: Those in which currents equal to, but opposite in direction to the disturbing currents are introduced into the telegraph lines. The best means to accomplish such neutralization will naturally depend on a consideration of all the attending factors, and is not likely to be the same in any two cases.

While I do not wish to give the impression of advocating the addition of wires to change the present grounded telegraph lines to metallic, I wish to point out that against the disadvantages of upsetting an existing system and expense of additional wires, there are many marked advantages to be gained by properly constructed metallic circuit for telegraph use. Not the least of these would be the possibility of simultaneous use for telegraphy and telephony. Such circuits should be less susceptible to wet weather conditions, on account of the two insulators in series between one side of the line and the other; free from inductive disturbances, due to neighboring telegraph wires; and free from earth currents.

In many cases a consideration of all the points may

show the advisability of using a metallic circuit, which when installed should be installed in such a manner as to give the full benefits to be derived from a metallic circuit. It also seems not unlikely that satisfactory duplex systems can be developed for metallic circuits, which should give the two wires of metallic circuit the same capacity they now possess as single grounded wires.

Many of the points considered apply equally well to telephone systems, and in many other respects the telephone requires special treatment, which is not touched upon at all in this paper.

In most cases of inductive disturbances there will be two parties involved, and it should be apparent that these two parties should confer freely as to the best means of eliminating or reducing disturbance. The engineers of the power companies are not likely to be conversant with all the details of the telegraph business, nor are the telegraph engineers any more likely to know as much about the conditions of operation of the transmission system. There is no doubt that in some cases inductive disturbances could be materially reduced, if not practically eliminated, at little or no expense to either party by consideration in conference of all the factors involved. It appears not improbable that the increasing number of electrical transmission systems, and the tendency to increased speed by the automatic working of telegraph lines will make this general question of inductive disturbance a more important one in the future than it has been in the past.

The paper was received with applause.

President Chenery: Mr. Taylor, we certainly appreciate

your remarks very much. The thanks of the association are extended to you.

Mr. Taylor, A. B.: As I understand Mr. Taylor's remarks, they relate to metallic circuit lines. I want to ask what the effect would be on a three-wire line, the power line transposed, say, every four miles, and the telephone line transposed every half mile, what would the change in the conditions be if the top wire in the system instead of being transposed with the other two is carried straight through. That is a condition which has come about on the Niagara Falls power line alongside of our West Shore telegraph line. In that case the Niagara Falls power line is carried on one side of the right-of-way and the telegraph line is carried on the other side. The average distance, I should say, between the two lines where the power line is on the right-of-way is probably seventy-five or eighty feet. At certain places the power line leaves the right-of-way and runs off for a half mile, but the greater part of the one hundred and ten miles is on that right-of-way an average distance of eighty feet. We have our telephone line on the telegraph poles and we haven't noticed any disturbance from that. Recently they have been cutting out the transpositions on the top wire and putting it straight. So far as I know we haven't suffered any serious disturbances from it. I have wondered just what would be the effect in making that change.

Mr. Taylor, J. B.: I have never seen a three wire power line transposed as Mr. Taylor describes, and I would be inclined to think the top wire is a grounded wire. I cannot imagine anybody running one wire directly through and going to the trouble of transposing the other two. There

are plenty of cases where three phase lines are run through without transposition, and it would be a queer proceeding to run one wire directly through and transpose the other two. Soon after the Atlantic City meeting I have learned that wires on this system have been changed as described by Mr. A. B. Taylor; the reason being to have a number of lightning discharge points at the top of pole all connected to the same wire of the system. J. B. T.

Mr. Taylor, A. B.: When this power line was installed there was a transposition every four miles, but since that they have straightened out the top wire.

Mr. Taylor, J. B.: Haven't they run an extra wire, also? The sky wire is often used as a ground line. The Mexican companies started without this ground wire, but later added one and changed it to a ground wire. There is a great increase in the tendency to put up ground wires many years ago.

Mr. Kelsey: The ground line puts telephone lines out of business, and the electrical companies have proved there is a remedy by having the metallic line transposed. I want to ask Mr. Taylor what he knows about taking care of such trouble.

Mr. Taylor, J. B.: Theoretically of course, it should be possible for metallic telephone circuits to exist in any sort of electrostatic or electromagnetic fields. Transpositions equalize matters, but the separation of the wires will vary and the points of transposition might come between two poles where it would be impracticable to theoretically place them. What is quite as important in this question of disturbance to telephone lines is the matter of insulation.

(Mr. Griffith related his experience in the matter of disturbances.)

Mr. Groce: The I. C. has had a varied experience with telephone circuits because we have a great deal of telephone installation and by metallic circuit. The suggestion has been made—and probably Mr. Taylor can advise us—that the transmission wire carrying these high potential currents, be encircled with a few windings of comparatively good-sized insulated wire, to use the wire as a coil, the telegraph circuit not to be broken, but carried through.

Mr. Taylor, J. B.: There is no question but what some such scheme would be an effective scheme. But it is hard to say what would be the most effective scheme, all things considered.

Mr. Camp: Regarding the amount of induction. As you increase the distance is the proportion direct to the distance or inversely as the square of the distance?

Mr. Taylor, J. B.: As a matter of fact, the induction falls off rapidly as you increase the distance, which can be mathematically computed.

Mr. Camp: A metallic line does not entirely eliminate earth disturbances. We have a number of high potential lines paralleling ours and have had a few complaints regarding the working of telegraph wires, but on investigation I found they were caused through a partial ground on the transmission wires.

Mr. Taylor, J. B.: We have in the last year made experiments with transformers between power lines and signal wires neutralizing the electrostatic and electromagnetic induction. In some cases such a scheme would appear serviceable. I cannot point to any particular road at this time that has such a scheme in practical operation.

President Chenery: I think the engineer of the A. T. & T. Co. might give us some information upon the subject.

Mr. Chetwood: So far as I know Mr. Taylor has described nearly every device that has been tried. Nothing perfectly satisfactory has been discovered to neutralize induction, though every device has had a certain amount of success under certain conditions.

Mr. Rhoads: Our tracks are paralleled for miles and miles with trolley lines, with wires on the adjoining right-of-way, and, for obvious reasons I presume, for more than half the mileage the high tension wires are carried on the side of the track near the steam road's right-of-way, so it places their wires very close to us.

About three years ago Indianapolis was the first to install one of these single-phase high potential circuits and that seems to prove satisfactory from the standpoint of the trolley company. Visitors are coming to our territory from all over the United States to study the question, with the result that it seems to be spreading. The C. H. & D. paralleled their line, and immediately the effect was such it knocked out the W. U. ticker service as well as interfered with the despatcher's wire so they frequently could not use it. During the last six months they have come over on to our Indianapolis and Cincinnati line and the probabilities are they are going to put it on other lines. Now the W. U. have a second pole line between these two cities on which service is interfered with in addition to our block wire which happens to be on this line of poles. Up to the present time we have been unable to get anything from the W. U. as to what their electrical department propose to do to obviate these disturbances. So far as I see, each corpora-

tion looks to the other to take some steps—if necessary, legal. That continues to spread in all directions. The subject is one of great interest to us because we have a thousand miles of block territory and that is going to be knocked out if the single-phase shall supersede the other, as it seems fair to do.

Mr. Maver: The subject has been so thoroughly discussed I do not think there is much left to be said. A remedy must be supplied either by eliminating the single-phase system or by avoiding its effects on telegraph and telephone circuits. Many minds are now at work on this exceedingly important problem and doubtless a happy solution of it will eventually be found.

Mr. Taylor, J. B.: There is a great increase in the tendency to put up ground wires. Many years ago they commenced to do it with barbed wire, but such wire is a mean proposition and for that reason it fell into disfavor. I would not advise anybody to use barbed wire, as the short barbs are of no use as additional protection and are a great disadvantage in handling and hard to clear in case of trouble. This ground wire should be good, stout wire without any barbs.

Mr. Parsons read the following paper, entitled: "Inductive and Other Foreign Disturbances on Telegraph Wires," by W. C. Stowell, wire chief, C. & A. R. R.:

INDUCTIVE AND OTHER FOREIGN DISTURBANCES ON TELEGRAPH WIRES.

By W. C. Stowell, of the Chicago & Alton R. R.

Foreign disturbances on telegraph wires, other than those caused by ordinary interruptions such as crosses, breaks and grounds, may be classed as follows:

Atmospheric, consisting of oscillatory waves, or disruptive discharges; conductive, consisting of cross talk and leakage from other telegraph wires, leakage from power circuits, or earth currents from power circuits; inductive, consisting of induction from other telegraph wires, from single phase or multiphase grounded power circuits, or from metallic circuit alternating current power circuits.

It is the intention in this paper, to simply give the result of several years experience, with such remedies for these troubles that suggest themselves, or have been tried in practice and found useful.

Under atmospheric disturbances will come lightning and the rare cases of waves passing over the earth during periods of excessive sun-spot or aurora borealis activity. The latter are so infrequent as to require no special remedy. The only known remedy is to employ metallic circuit by patching wires together at terminals and lift the grounds. This remedy failed four years ago when tried between Chicago and Buffalo, N. Y., on a single Morse Western Union circuit.

Disruptive discharges, including lightning and contact with high voltage power circuits are protected against by the various well known types of lightning arresters, requiring no special attention here except to give a few comments on the more common types, with the attendant results. The "Argus" arrester, consisting of a choke coil on porcelain form, with a ground connection very near convolutions of choke coil, has not proved satisfactory owing to breakage of the porcelain. It is also doubtful if the choke coil feature is of any great value. Some recent authorities claim the initial lightning discharge shows itself in one direction and not of high frequency, the high frequency waves, when

present, being a secondary phenomena caused by the capacity and inductance in circuits producing them inductively, or by condenser action. It is our experience that ordinary relays exert the choking effect and force the static into carbon or plate arresters, and that when cable poles as well as switchboards are protected by fuses and carbon block or non-arcing metal protectors, relays will not be damaged. An exception to this is noted in the case of low resistance relays made by putting spools of 150 ohms instrument in multiple. Such relays often go short to the core after lightning. This is not noticed with series wound relays. The worst case of relays burned out in our experience was due to ground connection having been taken off an Argus arrester at cable pole near terminal office.

While some authorities question the necessity of switchboard protection in addition to cable terminal arresters and fuses, it is our opinion, based on the frequency of fuses opening and carbon block or their equivalent arresters going grounded, and considering the danger of high voltage contact, that switchboard protection is desirable where it can have intelligent supervision, for by using smaller fuse at inside protection often time is saved by inside fuse blowing before outside protection does, saving a lineman trip to cable protection.

In testing for trouble after lightning, time may be saved by rough measurements with voltmeter and milammeter. A few experiments with voltmeter will enable one to judge approximate distance of an open fuse, by amount of static kick on voltmeter, while a ground can be developed by application of high voltage to burn it through and measured with shunted milammeter, using cell or two dry battery when

ground is close, resistance of such cells being so small, simple calculation will give the approximate resistance to ground. A shunt, accurate enough for this, may be quickly made by reducing full scale deflection through suitable steady battery circuit, to one-tenth or one-hundredth by piece of copper or German silver wire shunted around instrument and cut to proper adjustment. .

In testing for a partly open fuse or bad connection it should be remembered that relays give a high voltage kick back, in many cases enough to cause a partly open fuse or bad joint to close. In testing for such a trouble, after same has been developed, care should be taken to avoid such relay discharge by using very small battery and milimeter. to avoid closing the bad connection until same has been located in the ordinary way by having stations ground for test. The contrary is true for grounds, a high voltage should be used to burn them through, in certain cases it has been found possible to supply alternating current through condensers from telephone generator to maintain a short circuit or ground through a bad contact, at same time resistance is measured in ordinary with direct current instruments.

At large terminals it may be convenient to put a relay and bell in ground circuit to give notice when a line goes grounded, so can be remedied before causes delay.

Some magnetic devices have been constructed to avoid leaving a line open or grounded after lightning has disappeared, but we have no data as to their performance. Power companies are now experimenting with a water resistance to carry off lightning, with very satisfactory results.

Conductive disturbances from lines on same poles known

as cross talk may be separated from inductive trouble by tests with voltmeter and ammeter. Being detected as direct current on instruments and identified by opening successive circuits. An alternating current voltmeter is useful under recent conditions. A cheap form of magnetic vane voltmeter may be used as a millammeter for alternating currents, with slight correction in calibration, resistance such an instrument is usually too low for its deflections to be proportional to volts in telegraph work.

The remedy for conductive trouble is to patch circuits apart that show leakage to each other, or reduce battery on disturbing wires when possible, if necessary throwing out disturbing circuits. When leakage is from direct current power circuits, increased battery power or better conductivity is remedy. If from alternating power circuit increasing margin by more battery or better conductivity, or inserting inductance and shunted capacity as discussed later are suggested remedies. Cure is better insulation and higher conductivity. When these fail, only thing to be done is to move.

In a paper before this association at Indianapolis, by Mr. A. E. Roome, in June, 1904, entitled, "Pacific Coast Telegraph Conditions," conductive troubles are efficiently treated, see pages 128 to 133, proceedings of that meeting.

At this point it is proper to state that anything to increase the working margin on a circuit will tend to overcome these conductive and inductive disturbances. This will include improved conductivity, proper proportioning battery, and best insulation obtainable. We are working but two single wires out of each gravity battery on the Alton railroad wires at one point where ten wires terminate.

and but one or two wires at other battery terminals from each gravity battery. Since changing from three wires to a battery to but one or two, we are able to work through wet snow and fog on circuits that were unworkable in such weather before. Current used is kept at fifty to sixty milliamperes on local wires equipped with thirty-five ohm relays. That is, dry weather current is fifty or sixty.

Earth currents may be classed as direct or alternating. Interference on short wires is most noticeable, since the disturbing pressure more nearly approaches the line voltage as the latter becomes lowered for shorter lines. Remedy is increased margin of working current, metallic circuit, or in case of alternating disturbance, insertion of inductance in ground connection.

A successful method adopted by the writer to overcome such earth currents from direct current trolley cars between East St. Louis and Wann, Ill., on an eighteen mile block wire, with nine offices each working to a ground was to lift the ground connections and leg the former ground connection to a through wire at each station. Latter wire was a single Morse circuit from Chicago to St. Louis, with no intermediate offices between the block stations. This arrangement was successfully operated for two years during which time neither the block nor the through wire interfered with each other, and the earth currents were of course eliminated from the block wire. If the through wire went open in the block station district we were still able to work through it around via the block, trouble showing up on the block and being located between two adjacent block stations. If either wire went crossed or grounded trouble was quickly located between two adjacent block stations by proper tests.

The above arrangement has now been taken off to enable us to cut an intermediate office in on the through wire, and to experiment with heavy battery to overcome the earth currents. We have had about one month's experience since going back to the grounded arrangement, and by increasing the battery about one hundred per cent., have been working fairly well, although one or two block offices still complain of current in block sounders getting very weak or very strong when trolley car is in certain positions. We are correcting this now by adding still more battery at the points most affected.

We also encountered alternating earth currents on a block wire between Pontiac and Dwight, Ill., which were so bad as to render circuit useless at times. Before we could experiment with remedies operator's block was replaced by electric blocks. These earth currents came from a single phase trolley car system using 3,300 volts on trolley, using their rails for return circuit, 25 cycle General Electric equipment, about two hundred feet from the Alton tracks.

The value of inductance to be inserted in ground connection to choke back alternating earth currents would have to be determined by experiment; we find that the amount of inductive buzz on telegraph wires is largely influenced by the length of the circuit, its condenser capacity tending to accumulate more buzz, therefore conclude on short sections of block wires which are generally arranged to a ground at each station, a reasonable sized choke coil could be built to absorb such buzzing.

Such impedance coils must be built on laminated cores, closed magnetic circuit, made rather large so as to get

enough turns on them to get the inductance without unduly increasing the ohmic resistance. We are familiar with such impedance coils used with Composite telephones, but these telephone coils, being designed to only stop the very high frequency telephone waves, are too small for 25 cycle currents.

Induction from other parallel circuits indicates the following remedies:

First—Move.

Second—Use metallic pairs, no grounded circuits, transposing if necessary.

Third—Increase working margin of current.

Fourth—Introduce high impedance in series with the line at each end of exposure, with condensers shunted to ground between the impedances.

First and second remedies require no discussion.

Our experience with third remedy, increased margin, is successful as applied to our Chicago Bloomington quadruplex, distance 126 miles, iron wire, working balance in dry weather 3,200 ohms, dynamo battery at Chicago, gravity at Bloomington.

This quad was interrupted on an average ten minutes each hour by buzz on neutral relays and at longer intervals by same on polar side, trouble showing at both ends. This buzz would come past the repeating sounder and if adjusted away from it had no margin to work relays. Interference comes from single phase trolley induction between Dwight and Pontiac, Ill., distance 18 miles, battery used before remedy applied, 220 volts at each end. This successfully overcame the trouble, by giving us more margin on common side, and holding polar relay quiet during the periods of

strong induction, and we worked it this way for several days, but found that 350 volts was too much, as Chicago dynamo pole changer would arc after three or four hours use and require constant cleaning and adjustment, notwithstanding the fact we used a good spark condenser around it. We then reduced the pressure to three hundred volts at each end and have been successfully operating at that pressure for over a year, with no interruption from the trolley induction, except when the margin is abnormally reduced by wet snow or fog, have had one or two such days when it was necessary to abandon neutral side for few hours, and have also been compelled to keep the gravity battery at Bloomington right up to more than 280 volts to keep the buzz out, the induction showing up in proportion to the weakened condition of battery when neglected.

The Western Union have abandoned their quads between Chicago and St. Louis, Chicago and Kansas City, Chicago and Bloomington, Chicago and Peoria, Chicago and Springfield, Ill., and to one or two other points reached by Chicago via this route and are either using other routes or working the circuits as polar duplexes; when doing the latter they find it necessary to operate at the highest potential, 350 volts on the longer circuits, to keep the polar sides quiet. With lower potentials the polar sides would buzz at intervals.

The fourth remedy, impedance and shunted condensers has not as yet been worked out. We find that 10 henrys inductance will annul about two volts buzz on 150 ohm relay. We know that 20 to 40 thirty-five ohm relays on the local wires between Bloomington and Chicago will entirely annul the buzz on circuits whose companion circuits on same route show bad interference, when latter have no

intermediate offices cut in. The buzz seems to be a trifle worse on copper wires than on iron. We have tried inserting various kinds of choke coils at terminals such as telephone repeating coils, and small impedance coils made for Simplex telegraph and telephone combinations, but cannot entirely annul the buzz. Western Union people have made some experiments with repating sounders on their leased copper wires, but with very unsatisfactory results.

It certainly looks like shunted condensers and impedance coils would take off the buzz and we understand some roads, the C. M. & St. P. for example, can work their quads through several 150 ohm relays, showing a certain amount of inductance will not ruin a quad, although the writer's experience has been that telephone repeating coils, simplex telephone choke coils, several relays and certain other coils inserted in our Chicago-Bloomington quad circuit rendered the neutral side too sluggish. An exception was noted in the case of our Simplex circuit worked on a pair of number 14 coppers wires from Bloomington to Chicago, the telegraph side of which works through two coils known by the telephone people as "37A" repeating coils. We find our Chicago quad, even with the 300 volts on it, works first class through this impedance. These are large coils of low ohmic resistance, about 40 ohms to the telegraph current, and very high impedance to alternating currents of voice frequency.

Calculation shows the ohmic equivalent of 10 microfarads capacity for 25 cycles is 637 ohms. The impedance of one 150 ohm relay is about 235 apparent ohms to 25 cycle sine wave alternating current.

We have tried to work a Simplex telegraph circuit

through a pair of telephone wires, distance between terminals 126 miles, with 10 micro-farads in each side at each end. That is, the capacity was in series with each side of the telephone wire at the terminals for the purpose of talking and ringing through it, to separate the telephone side from a grounded common battery system, we found this capacity too great to work the Morse circuit through—the telegraph relays were too sluggish and the terminals could not break each other. We understand others have had similar experience, the Illinois Central among others. It is a familiar condition on some of the A. T. T. Co. lines.

The problem, then, is one to be submitted to Electrical Engineers to design such capacity and inductance as will dispose of the foreign impressed alternating pressure without rendering single or multiplex Morse systems too sluggish or reducing working margin too much. Our idea would be to connect it up so the impedance coils would be at the ends of the exposed section, but making the ground connections to the condensers at points far enough away from exposed sections to escape alternating earth currents, if necessary moving the impedances and condensers to stations distant from terminals of exposure, in order to escape such earth currents.

The last case to be considered, induction from metallic circuit power feeders, requires same treatment as single phase grounded circuit exposure.

Our experience has been limited to a forty thousand volt transmission line, parallel to us for about twenty-five miles, but from five hundred feet to quarter of a mile away from the railroad's wires. We experience no interference from this system, but the long distance telephone people were

closer and had to put in more transpositions and at certain places, to move.

In this connection will mention experience on simplex telephone circuit, Chicago to Bloomington, on which serious noise developed from the Pontiac Dwight induction, when we used impedance coils with open magnetic circuit on solid cores. We cut in more transpositions and got the line quiet as long as the telegraph side was left open, but noise was bad when Morse side was closed. Substitution of laminated core, closed magnetic circuit impedance coils entirely removed the noise from telephone side, latter coils having the same resistance and same number of turns as the solid core ones had.

The extension of high pressure long distance transmission lines, prolific growth of single phase alternating current traction, electrification of steam railroads and development of water power resources throughout the world, is invading every state in the Union, and radical action is necessary to keep these circuits away from our telegraph and telephone lines.

The electrical engineering profession, as a whole, having many years ago abandoned the telegraph field for more alluring work, now show a marked indifference to the disastrous effects of their transmission systems on those older servants of the people, the telegraph and telephone. The time is now at hand for a change, and we trust that after experiencing the serious effects of such interference on electrified steam railroads like the New York, New Haven and Hartford, with its heavy currents and single phase trolleys, that the best engineering talent will be employed to contrive methods and design instruments to work under these new conditions.

The commercial companies, telephone, telegraph and railroads, should unite in their efforts to compel the power companies to recognize their prior rights, and legislation should be devised and pushed to restrict the ruin of existing lines of communication by power circuit invasion.

Mr. Selden moved that the convention adjourn, to meet at 8:15 P. M. in executive session,

Which was seconded,

And agreed to.

SECOND DAY—MORNING SESSION.

(Thursday, June 20, 1907.)

The convention was called to order by President Chenery at 9:30 A. M.

Secretary Drew: We had a telegram yesterday from Mr. Foley regretting he could not attend on account of the illness of his sister. I received a telegram as I went out of the afternoon meeting in which he advised the death of his sister. So I responded to the telegram and sent him, as from the association, an expression of our sympathy with him and his family.

President Chenery: The first paper we have for this session is Mr. Maver's.

Mr. William Maver, Jr., read the following paper:

WIRELESS TELEGRAPHY, SOME OF ITS PRACTICAL AND COMMERCIAL ASPECTS.

By William Maver, Jr.

Part 1. Technical Aspects.

Wireless telegraphy now appears to be settling down on

a practical basis. It is finding its field to be where all those who have not been actuated by interested motives have consistently stated it would be found, namely as a means of communication between ships at sea and between ships and the shore. How long it will hold this field undisputedly depends upon the measure of success that may attend the efforts of those who are now endeavoring to perfect wireless telephony. At least half a dozen inventors are at work on this problem in this country and Europe and it is reported that the wireless transmission of speech has been experimentally successful up to distances of several miles overland; but apparently much remains yet to be done before wireless telephony, even for short distances, becomes an accomplished fact. Should this hoped for result be achieved, however, it is evident that for many purposes it will displace wireless telegraphy. For example, probably one of the chief reasons why wireless telegraphy is not already universally installed on all manner of sailing vessels and steamships is the necessity for employing an expert Morse operator to transmit and receive messages. Wireless telephony, even if only available for a distance comparatively short, obviously could be installed to advantage in the officer's room of every ship that floats the ocean, lake, river or harbor, and perhaps on railway trains as well, for any purpose that might arise.

Wireless telephony is not yet here, however, while fortunately for those that go down to the sea in ships, wireless telegraphy is here and it is already installed or is being installed on every lighthouse and on the vessels of every important navy and steamship line in the world. It is probably easily within bounds of accuracy to say that there are now over 2,000 wireless stations, including ship and

shore stations, in operation in various parts of the world and this number is being added to daily.

The distances covered by wireless telegraphy in regular operation may be set at from one mile to fifty or one hundred miles. When the statement is made, as it frequently has been, that messages have been received from ocean going vessels several days out from New York, it may be taken for granted that these messages have been received at one or the other of the Atlantic Coast stations within wireless signaling distance of the vessel, and by these stations repeated by overland wire telegraphy to New York. There is no doubt that messages are received under favorable conditions at distances of several hundred miles from shore, but these are exceptional cases. No regular interchange of business is at present carried on at those distances.

While we frequently run across the statements of interested brokers in wireless telegraph stock that trans-Atlantic wireless telegraph will shortly be accomplished, it is noticeable that Marconi, Fessenden and De Forest have of late been silent on this subject. Fessenden indeed has with commendable frankness, practically admitted that the difficulties of trans-Atlantic wireless telegraphy are at present well nigh insurmountable. His experiments were continued for nearly one year between Massachusetts and Scotland. He found that there are at least two serious obstacles in the way of trans-Atlantic wireless signaling. First, atmospheric absorption of the electric wave energy of the signals. Up to distances of 1,000 miles this absorption is not very marked, but beyond this point it becomes very important. The other difficulty consists in the inability to maintain sympathy or tuning of the apparatus, at the respective trans-

mitting and receiving stations. The difficulty, in the words of Mr. Fessenden, "is in getting the stations which are to communicate to maintain their frequencies sufficiently regularly." It was found impossible to receive messages when the frequency varied one part in one million. This it may be noted, is equivalent to saying that if a telegraph system which depended for its successful operation upon the synchronism of wheels at the sending and receiving stations, should vary one part in one million the system would not operate. While Mr. Fessenden is hopeful that these difficulties will be overcome, the prospect for an immediate realization of this hope is not very encouraging. But fortunately again there is no real necessity for trans-Atlantic wireless telegraphy, or cableless telegraphy, as some wireless experts take pleasure in terming it. The Atlantic cables are still doing business at the old stand and there is every reason to believe that they will continue to do so for many years. Singular as it may seem to some people there is, apart from occasional injury to the cables, no method of telegraphing, that is as reliable as submarine cable telegraphy. The reasons for this are obvious. The cable, year in and year out, works undisturbed by changes in weather conditions. Lightning storms do not affect its operation, and vagrant currents from neighboring and unneighborly electric traction circuits, or induction from high tension alternating current systems, can never approach within harmful distance of its sensitive apparatus. Similar immunity from these disturbing factors in overland telegraphy would there is no doubt be gladly welcomed by the members of this association.

Aside from the filings coherer it may be said that the most prominent type of detectors now in use are the mag-

netic detector employed by the Marconi interests, the carborundum detector employed by the De Forest Company and the various electrolytic detectors of the Fessenden and Shoemaker types. The magnetic detector, the carborundum detector and the electrolytic detector require a telephone receiver for the reception of signals. The magnetic detector was described in the author's paper on "Improvements in Wireless Telegraphy," read before the Indianapolis convention of this association. The carborundum detector consists of a crystal or carborundum which is clamped between two metal electrodes. Otherwise so far as the arrangement of circuits is concerned, it simply displaces the filings coherer, but does not operate a relay. The electrolytic detector consists of a small cup containing a dilute solution of nitric acid, into which the terminal of a very fine platinum wire is placed. Another wire enters the acid from the bottom of the cup. When current from a small dry battery is passed through the solution by means of the fine wire, polarization takes place, and current ceases to flow in the circuit. Incoming electric waves appear to dissipate this polarization, causing variations in the current of the local circuit and sounds corresponding to dots and dashes are heard in the telephone receiver.

The De Forest Audion is also one of the more recently invented wireless detectors. This detector, briefly described, consists of an incandescent filament in a vacuum, shunted by a local circuit in which is a battery and a telephone receiver. Incoming electric oscillations appear to affect the electrical condition or equilibrium of this circuit and set up variations of current therein which are heard as dots and dashes in the telephone receiver. This receiver was fully

described in the Transactions of the American Institute of Electrical Engineers for 1906.

Another detector which promises to be of utility in practical wireless telegraphy is the Silicon detector, the invention of G. W. Pickard. This detector is of the thermoelectric type of wireless receivers. It produces its own electro motive force. Its electrodes are pure Silicon and a metallic element of low resistance. The energy of the incoming electric oscillations are converted into joulean heat ($C^2 R$) at the element having high resistance (the Silicon) which heat is converted at the contact point into a short pulse of direct current in the telephone receiver; and a long or short continuation of these pulses produces a dash or dot in the receiver. Mr. Pickard states that a fragment of Silicon merely held with suitable pressure between two flat ended brass rods gives excellent commercial results. This detector has the advantage that no battery is required in the local circuit. In sensitiveness it compares favorably with the electrolytic and magnetic detectors, according to tests made by Mr. Pickard. The carborundum detector is about one-half as sensitive as the last named detectors.

It is interesting to note that the telephone receiver has been found to respond to a single impulse of current of very much less strength than is required to energize the most sensitive wireless detector, and were it not for the high inductance of the telephone receiver, the intermediate wireless detector would not be necessary. At the high frequencies used in wireless telegraphy, however, namely of the order of five hundred thousand or one million per second, the inductance of the telephone receiver renders it mute.

An improvement in wireless telegraphy that may lead to important results consists in the use of undamped oscilla-

tions with which numerous experiments are now being made by Poulsen, Shoemaker, The Telefunken Company and others.

In the ordinary "spark" gap transmitter, it is known that between each spark or train of sparks there is a rapid falling off or damping of the amplitude of oscillations; consequently the full benefits of resonance in the tuned receiving circuits are not obtainable. Poulsen's method of obtaining undamped oscillations is an amplification of the Duddell "Singing arc" and consists in employing an electric arc of peculiar construction shunted with a capacity (condenser) and inductance of a wireless transmitting circuit.

In Poulsen's device the positive electrode is copper; the negative electrode is carbon. When the capacity and inductance are suitably adjusted rapid oscillations of uniform amplitude are established in the circuit and thence are thrown upon the vertical wire. These oscillations are broken into dots and dashes in the usual way. Unfortunately, thus far, the energy output by this method is low and it remains to be ascertained whether or not the advantages of uniform amplitude by conducting to a better utilization of resonance, will more than offset the disadvantage of reduced energy output.

Another improvement in the practice of wireless telegraphy consists in the employment of electric wave meters by means of which the wave length or the wave frequency may be measured. These wave meters are based primarily on the principle that with an exciting circuit in proximity to a secondary circuit, a maximum current will be induced in the secondary circuit when the two circuits are in resonance, which will be when they possess corresponding in-

ductance and capacity. Knowing the capacity and inductance of the secondary circuit, the frequency and wave length of the oscillations are deducible. (A detailed description of electric wave meters may be found by those interested, in the last edition of the author's work "Wireless Telegraphy.") Increased familiarity of the operators with the apparatus has also naturally tended to improved results in the actual operation of the various systems. Apart from the foregoing noted features and certain improvements in the details of apparatus and the arrangement of vertical wires, there has been comparatively little advance made in the art of wireless telegraphy, during the past one or two years.

A short description of some experiments conducted recently by the Telefunken Wireless Telegraph Company of Berlin, relating to the use of wireless telegraphy between railway trains in motion and fixed stations, may be of interest to the members of this association. The experiments were made on sections of railway track about 12.5 miles in length, with four stations about four miles apart within this distance. The wireless outfit of each fixed and moving station consisted of a filings coherer receiver, and an induction coil transmitter, together with the other apparatus usually employed therewith. A coach containing the wireless outfit was equipped with a rectangular wire suspended by posts about one foot high at each corner of the roof of the coach. The wire was attached to porcelain insulators on the top of these posts. A single wire was led from ~~the~~ wire to the apparatus within the coach. A ground was obtained through the iron trucks of the coach. The fixed station was between the telegraph poles. The aerial wire

was erected horizontally between the poles and paralleled the regular telegraph wires for a distance of 193 feet, about one foot therefrom, and was carefully insulated from those wires. A wire connected this aerial wire to the apparatus in the fixed station. The ground was made by a wire connection to the nearby rails. Current for the induction coil was supplied by eight portable storage cells giving 16 volts and having an output of about 3 amperes with a spark gap of .12 inch. The maximum distance of the train from the tracks was 65 feet.

By this arrangement reliable signals were sent and received at a distance of 7.5 miles.

As several of the members of this association have had experience with other methods of telegraphing to and from moving trains, they can probably enlighten the association as to the necessity of improvements over those methods, and also as to the utility of such systems in general.

Part 2. Commercial Aspects.

The opinion of the writer has been frequently asked as to the merits of the great claims that are being made relative to the divided earning capacity of wireless telegraphy by the brokers who appear to have assumed control of the stock selling end of one or more of the wireless companies. A few remarks bearing on these claims may not be inappropriate at this time.

Let us first discuss the wireless telegraph earnings on the basis of the exchange of messages between ship and shore stations. According to the published reports of one of the wireless companies which has its system installed on 78 steamships plying between Europe and the United States, the gross earnings for the year 1906 were approximately

\$55,170.00 for messages exchanged between ship and shore stations. This figures out to approximately 25,823 messages for the year, which is equal to a total of 70 messages per day, or less than one message per day per ship. How much, if any, of this revenue goes to the foreign wireless telegraph company that presumably owns the wireless apparatus on the ships, is not stated. Presumably certain royalties may have to be paid by the ship owners for the use of the apparatus, and there may also be additional revenue for "news" service received on shipboard. But granting this, it is difficult to figure out much net revenue after the salaries of officers and operators have been paid.

This is perhaps the best showing that can be made for wireless telegraph companies doing a general commercial business in this country, or with the ships that sail United States waters. When it is stated that hundreds of steamships own their own wireless apparatus outright and do considerable business with government wireless shore stations without charge the difficulty of seeing a bright prospect for the earning of dividends on capitalizations amounting to 6, 8 or 10 millions of dollars by a legitimate exchange of wireless messages between ship and shore stations is largely increased.

One of the large German wireless telegraph companies has confined its business almost exclusively to the manufacture and sale of its apparatus outright to customers, and it is understood they have made fair profits. Several companies in this country are doing likewise. Obviously, therefore, there is no monopoly of this art on the part of any one company, although such a claimed monopoly is the chief stock in trade of certain of the stock brokers referred to.

An analysis of the published claims put forth by certain stock brokers to induce the purchase of stock in a wireless telegraph company shows some glaring misstatements, seemingly at least calculated to mislead prospective customers as to the constructional and operating costs, etc., of the system. Another method to induce purchase of stock consists, or did consist, of sending out broadcast by mail, circular letters offering stock of a wireless telegraph company at \$110.00 per share, guaranteeing 5% per annum on the stock for 5 years. This appears a fair enough proposition until it is known that the stock was at the time offered on the New York curb at \$30.00 to \$36.00 per share. This offer was accompanied by the most glowing accounts, without regard to the difficulties in the way of the prospective earnings of the company, by means of trans-Atlantic wireless telegraphy and by overland wireless telegraphy as well. It is but fair to say that the managers of at least one of the companies whose stock is being used in this way has disclaimed any responsibility in the matter. Unfortunately it is to be feared that the brokers were only too successful in unloading stock to unsophisticated purchasers on this basis.

The paper was received with applause.

Mr. Selden:— This is a most interesting paper. A friend of mine accosted me sometime ago and said he had \$20,000 he was going to invest in that stock. I asked if he would like to make \$10,000. He said, "Very much." I said, "All right. Give it to me now and keep the other \$10,000." (Laughter.) The claim at that time was made that they were going to transmit messages for ten cents, as having no wires to maintain they could do it and make a profit. I told

him from the experience we had had in the telegraph business, that, without counting the expense of wires whatever, every ten cent message cost eleven and seven-eighths cents, and that I thought he had better keep out of the business.

President Chenery: This association is certainly indebted to Mr. Maver for this paper. Every topic committee puts Mr. Maver down at the head of the list and he has never disappointed us.

Mr. Selden moved the paper be printed in the proceedings and a vote of thanks tendered Mr. Maver,

Which was seconded,

And agreed to.

Mr. Marshall: I have had some experience—I haven't any stock—with wireless telegraphy. We are making a great advance in the uses of wireless telegraphy, and you gentlemen have an opportunity here to see just what can be done. One of our principal stations on the Atlantic seaboard is at Atlantic City, at the end of Young's pier. I just came from there this morning. The station has been sending out news to the ships that are passing for probably an hour, all the principal items of news gone out of the steamships this morning will be printed and the papers placed for the passengers at their breakfasts.

I want to assure you that it is beyond the experimental stage. We have disturbances the same as you have in telegraphing. This station here is as simple as we can make it to accomplish results. The stations are at intervals all up and down the coast so a steamship can be almost continuously in touch with the shore. We can send messages to the officers and receive orders. In cases where there has been serious accident they have called for assistance and it

has been promptly given. So our modern service is thoroughly a success.

I think the most expensive experience-lesson the wireless people had to learn was that of competing with the wire people in the item of news. The wireless telegraphy cannot compete with the W. U. on a ten-cent basis. It cannot be done. Our service costs too much to do that. In fact, we cannot do it on a twenty-five cent basis as we have learned.

There are some places where inland service can be made profitable; where there are intervals of one hundred and fifty miles over rough country and the lines would be destroyed for some reason. We know wireless stations can be so placed as to supplement your lines and hence keep up communication when your lines are down. This will come to some extent, and we are going to present this to you because we have been enabled to get our apparatus so simplified and so reliable that it can be used.

The cost of a wireless telegraph station apparatus, such as we have at Atlantic City and such as you would require, can be sold to you for less than one thousand dollars. You cannot construct many miles of line for that. This apparatus, as I say, has been simplified. We find that by taking a W. U. operator and training him for a week he becomes proficient. To get the sounds coming in correctly the ear has to be trained for the purpose. But taking any ordinary telegraph man in a very short period he will become competent in wireless.

I have made arrangements so you gentlemen can go on the pier and see our station without any charge at the

entrance of the pier, and I will be glad to have you call there. (Applause.)

Secretary Drew: Does that one thousand dollars mean one station or a pair of stations?

Mr. Marshall: One station.

President Chenery: The invitation to visit the station was extended yesterday. I think it would be very interesting.

Mr. Cellar: For what distance do you consider this can be practically operated?

Mr. Marshall: Our station here is good for two hundred and fifty miles over water, and, I think, such a station would be good for seventy-five miles over land.

Mr. Camp: The DeForest company has a wireless system between Montreal and Quebec, a distance of one hundred and seventy-eight miles, and it worked successfully in so far as the actual transmission is concerned, but has not been a financial success. I know it has been working all right because I had an apparatus located in my office and found it very easy to read the matter going over it.

Mr. Rhoads: What would be the effect between two large cities, between Indianapolis and Cincinnati? There are all kinds of circuits in the cities and if installed what would be the effect on the wireless?

Mr. Maver: Generally speaking, I think the effect of those circuits would be detrimental.

As regards the wireless telegraph displacing the wire telegraph. It might be possible to send between points where only one message is transmitted at a time, but to send two

or three hundred messages at the same time would be extremely difficult.

I should like to know of Mr. Camp if the wireless system is working regularly.

Mr. Camp: The circuit has been working for the last two or three years and working daily. One of our French papers in Montreal did for a long while,—I do not know whether they are continuing—receive daily news. They attempted to establish a circuit between Montreal and Ottawa, 112 miles, but Mt. Royal is between the city and Ottawa and they have erected a tower on the other side of the mountain. The circuit is not in operation yet.

Secretary Drew: The wireless people erected a tower at Milwaukee and expected to use it for considerable service between there and Chicago, which would be over the waters of the lake. When the old-timers were in Milwaukee four years ago, they gave a little exhibition, and we had some conversation with the operator in Chicago. But it proved to be an expensive arrangement, as they did not succeed in doing any commercial business to any extent. They took the tower down—having sold probably all the stock they could get people to buy—and there is now no wireless communication between Milwaukee and Chicago. But there are some lake vessels fitted up with wireless that do communicate when out on the lake with Chicago to their great advantage.

President Chenery: We will pass to the next paper, entitled: "**The Use of Special Instruments in Telephone Service.**" by Robert E. Chetwood, Jr., of the American Telephone and Telegraph Company.

Mr. Chetwood read the following paper:

THE USE OF SPECIAL INSTRUMENTS IN TELEPHONE SERVICE.

By Robert E. Chetwood, Jr.

Three distinct classes of lines are used in commercial telephony. There is, first of all, the line connecting the subscriber's instrument to the nearest central office, and this is known as the subscriber's line. Another class of line is that connecting two central offices in the same city or connecting the central office, or offices, as the case may be, with the long distance office. These lines are known as trunks. The third class of line used in commercial telephony is the toll line which connects the long distance, or toll offices, in different cities.

In the case of the larger cities, where a considerable number of telephone sets are required by one subscriber, as, for instance, a department store or hotel, private branch exchanges are installed and the subscriber's line is then the line connecting a telephone set with the private branch exchange switchboard, while the lines connecting the private branch exchange with the nearby central office or with the long distance office are known as trunks.

Considering the subscriber's line, you realize that it may be but a few hundred feet long, or that in extreme cases it may be several miles long; that it may consist of twisted pair insulated wires, or may be composed of uninsulated copper wires strung on a pole line; or that it may be a pair in an underground or aerial cable according to the particular type of construction used. It will of course be recognized that a trunk may be of short length or several miles in length, and that it also may be composed of any

one of a number of kinds of wires according to the traffic and construction requirements of the situation. As for the toll line, it may be nearly any distance in length and contain lengths of aerial, underground or submarine cable.

As an illustration of the above, it can be said that in several cities the subscriber's lines vary from a few hundred feet to two or three miles in length; that the trunks vary from a fraction of a mile to over ten miles in length; and that as far as the toll lines are concerned, they vary from less than one hundred to over one thousand miles in length.

From the above brief description of the classes of lines used in commercial service it is seen that the subscribers instruments must be capable of giving satisfactory service over many different combinations of lengths and kinds of circuits and that the best type of instruments, by this is meant the best combination of transmitter and receiver, is that which answers most satisfactorily the two following fundamental conditions:

(1) When used for service between subscribers separated by but a short distance, as, for instance, subscribers connected to the same private branch exchange switchboard, or subscribers connected to the same local office, the volume of transmission must not be too great to be disagreeable.

(2) When used for exceedingly long haul service, as, for instance, between subscribers connected by a toll line several hundred miles long, the volume of transmission must be loud enough that persons not well versed in the use of the telephone can carry on a conversation without difficulty and without frequent repetitions.

To meet the above two conditions the present standard instruments have been found to be the most satisfactory,

these instruments consisting of a high resistance transmitter and bi-polar receiver, which, when associated with properly designed induction coils, are used for both local battery or common battery service, and these instruments are known as standard instruments. In what follows the term "standard instruments" will mean the above instruments when used as above described.

The two fundamental conditions that are mentioned above are, of course, not all the factors that determined the efficiency of transmitters and receivers that best answer the many varied requirements of commercial telephone service. A number of other factors have been considered and given weight, a few of the more important ones being as follows:

No matter what class of line that is under consideration the question of cross-talk between circuits in the same cable, or circuits on the same pole line, will largely enter into and determine the proper efficiency of transmitters that should be made standard for commercial service.

In a paper entitled "Transpositions of Telephone Lines, Cross-Talk and Induction," by Mr. F. F. Fowle, and read by him at your annual convention at New Orleans in 1903, Mr. Fowle treated the subject of cross-talk and induction very thoroughly, both from a theoretical and practical standpoint. In this paper Mr. Fowle pointed out the relationship existing between cross-talk and separation between circuits. Mr. Fowle showed how necessary it was to transpose the wires of a circuit at certain determined intervals, the frequency of the transpositions being determined from the number of circuits on the pole line and the relative location of the circuits with respect to each other. He also

pointed out that the larger the number of circuits carried on a pole line the more complicated and numerous become the transpositions.

In commercial service, the telephone lines rarely are of less than forty wires, that is, twenty circuits ultimate capacity, and often run up to sixty, eighty, or one hundred wires ultimate capacity. It is thus seen that a system of transpositions for large lines becomes a fairly complicated one. Furthermore, no matter how the actual transpositions are made, that is, whether the wires are transposed according to what is known as the two-pin or the single pin method, the wires that are being transposed are brought fairly close together on the transposition insulators and during damp or rainy weather the insulation between the wires is apt to become low at these points, which, of course, as will be shown later on, is most undesirable from a transmission standpoint.

With the above in mind, it is readily understood that there is a relationship between the efficiency of the transmitter to be used and the transposition of the line circuits. If a more powerful transmitter is used than the present standard, then, in order to prevent cross-talk between circuits on the same pole line, that is, to prevent one subscriber from learning the business secrets of another subscriber, it is necessary at a considerable expense to transpose the circuits much more frequently, with the result that this increase in the number of transpositions introduces the possibilities of transmission losses and in that way cuts down part of the gain in transmission which the more powerful transmitter would otherwise give.

It is also known that it is physically impossible in any

of the large cities to carry the circuits necessary for commercial service on pole lines and that cables, either underground or aerial, must be resorted to. The circuits of the cable must of course be transposed for the same reasons that the circuits on a pole line are transposed. This is done by twisting the wires in pairs and these pairs are then made up into a cable by layers, each pair in that way being transposed against the other pairs forming the cable. Now, as Mr. Fowle pointed out, the less the distance between circuits the greater the number of transpositions necessary, so that when wires are twisted together into pairs and then made up into a cable it is at once realized that being exceedingly close together it is necessary to twist the wires closely, that is, put in a large number of transpositions per circuit. It is also realized that there is a limit to the number of twists that can be given to any one pair and still have the wires insulated from each other and obtain a cable of a low mutual electrostatic capacity, that is, a cable of high transmission efficiency.

While in the last few years considerable improvement has been made in the manufacture of cable, still to-day the subject of cross-talk in cables is a serious one, especially in toll cables of high transmission efficiency, and this cross-talk places a limit on the efficiency of the transmitter that can be used for commercial service. The existing standard instruments have been found to best answer the requirements which have to be met regarding volume of transmission and cross-talk when circuits are carried in cable or open wires, and the instruments used for transmission over long or short lengths of cable or open wire, or combinations of both types of circuits.

Another factor which has determined the proper efficiency of transmitters for commercial telephone service is that known as "side tone." You probably know what side tone is, in fact, you have probably experienced the disagreeable effects of side tone when you have found it necessary to shout into a transmitter in order to make the subscriber at the other end of the line understand what you have to say. With an exceedingly sensitive transmitter the side tone becomes so loud as to be intensely disagreeable, and interferes with good transmission. In fact, it might be said, that where there is excessive side tone the effect on the ear is such that it is not in condition to receive to the best advantage the transmission from the distant end of the circuit. In other words, excessive side tone affects the ear so that when a person has finished talking and the party at the distant end starts to talk, the ear is not in the best condition for receiving and understanding what is being said, the excessive side tone having produced a temporary deafness, as it were.

Still another factor which determines the efficiency of the transmitters to be used, is, that with a sensitive transmitter, all noises in the room in which the transmitter is located are taken up by the transmitter and sent out on the line. I think you probably all know how hard it is to carry on a telephone conversation when anyone is hammering in the room, and those of you who have offices close to busy streets, have, in summer time, when the windows are open probably experienced considerable difficulty in carrying on a conversation when heavy traffic is passing by. A sensitive transmitter picks up very easily extraneous noises and transmits them to the line circuit and this factor has been given due weight in determining the proper efficiency of the present standard instruments.

In regard to telephone receivers, the question is often asked why a more sensitive receiver is not used so that a much greater volume of transmission can be obtained, with the same current, than is obtained with the present receiver. The answer to this question is much the same as to the question regarding why more powerful transmitters are not used, namely, on connections between subscribers connected to the same local office the volume of transmission would be too loud for satisfactory service. Cross-talk that now exists in cables and on open wire lines and which now is not noticeable, would, if more sensitive receivers were used, become troublesome and make necessary more numerous transpositions per circuit, which, as before pointed out, results in introducing transmission losses, and in that way counteracts the advantage of the more sensitive receiver. Furthermore, all line noises due to light leaks on a toll line for instance, or due to induction from neighboring electric light or power circuits, would be magnified, if a more sensitive receiver were used. I feel safe in saying that in the case of many circuits which are slightly noisy, due, for instance, to a leak on one of the wires, the noise not being very noticeable with the present standard receiver, would, with a more sensitive receiver, become so noticeable as to make the circuit unfit for commercial service. Increased side tone also is an argument against more sensitive receivers the same as against more sensitive transmitters, and the amplifying of extraneous noises applies to the receiver in the same way as it does to the transmitter.

To summarize what has been said, the transmitters and receivers which are in commercial service to-day and which have been designated as standard instruments are the ones

that have been found to be best adapted for universal use, under the varying conditions that have to be met with, taking the telephone plant as it to-day exists.

It may be asked that if the existing standard instruments are considered to be the best adapted for universal use, considering the telephone plant in its entirety, in what way and by what means will the range of commercial telephony be extended, and how will it be possible at some future time, when the lines have been built and circuits are available, to obtain satisfactory transmission over distances much greater than at present. I believe the range of commercial telephony will be extended mostly through improvements in the line circuits themselves rather than by the use of more powerful transmitters or more sensitive receivers. In other words, I believe that the transmission losses in the circuits will be considerably reduced below the losses at present existing, that is, that the circuits will be made of higher transmission efficiency, by several different methods.

Considered, for example, a circuit several hundred miles long over which, under present conditions, a certain volume of transmission is obtained. It is well known that of the amount of current placed on such a circuit by the transmitter, but a small percentage of it reaches the receiver at the other end of the line. The difference between the current placed on the circuit at the transmitting end and the current that reaches the receiver at the distant end represents the transmission losses in the line itself and in the apparatus associated with the line. This difference in the transmitted and received currents is known as the attenuation in the circuit.

Considering a metallic telephone circuit it is known that there are four factors which regulate the transmission

efficiency of the circuit, that is, determine the amount of attenuation in a circuit. These four factors are as follows:

R, or the resistance of the circuit per unit of length.

L, or the inductance of the circuit per unit of length.

C, or the mutual electrostatic capacity of the circuit per unit of length.

S, or the shunt resistance of the circuit per unit of length, the shunt resistance being the mutual or the wire to wire insulation resistance of the circuit.

The four factors are related to each other and the relation existing between them can be expressed by the following formula:

$$A = \frac{R}{2} V \frac{C}{L} U \times \frac{L}{RCS}$$

where A is the attenuation of the current in a circuit, as previously described.

As it is of course desirable to make the attenuation on the circuit as small as is economically possible, it is at once seen that A can be made smaller by changing any one or all four of the circuit constants, R, L, C, and S. First of all, A can be made smaller by decreasing R, that is, increasing the size of the line wire, namely, using more pounds of copper wire per mile. This, of course, is a most expensive method of improving transmission. Furthermore, as you get up into the larger sizes of line you have to greatly increase the weight of copper to obtain a small improvement in transmission.

For example: a circuit composed of wires weighing 300 pounds to the mile will give approximately the same transmission over a distance 200 miles longer than if the circuit was composed of wires weighing 200 pounds to the mile:

that is, the extra 100 pounds of copper per mile increases the range by about 200 miles. Now, taking a much larger size wire, say, for instance, weighing 800 pounds per mile, this will give approximately the same transmission over a circuit about 140 miles longer than a circuit weighing 700 pounds to the mile. In this case the extra 100 pounds of copper per mile increases the range only about seven-tenths as much as in the previous case. Furthermore, the larger the size of line wire the closer together must be the poles in the pole line in order to carry the heavier load, which means of course more insulators per mile and a lower insulation of the circuit. From the general relationship of cost and transmission, I do not believe that under existing conditions a wire much larger than a No. 8 B. W. G. wire can be justified in commercial service.

The second method of reducing attenuation is to increase L , the inductance of the circuit. Improving transmission in this way is known as loading a circuit and consists of installing in a circuit, at certain indefinite intervals, coils of low ohmic resistance and high inductance, the coils themselves being known as loading coils.

The value of inductance in reducing the transmission loss in a circuit has been known for some time, but no practical method of adding inductance to a circuit was discovered until Dr. Pupin disclosed his work on this subject and made it possible to improve transmission in this way.

But loading also has its limitations. In the first place a loaded circuit requires a much higher insulation resistance than a non-loaded circuit and also the circuit must be of a certain minimum length before the value of the loading

becomes apparent in increased transmission. It is a fairly expensive method of improving line transmission as the coils are expensive to make and on open wire circuits must of course be protected from lightning. The greatest success in loading, so far obtained, has been in connection with cable circuits, where the insulation can easily be maintained at a high figure, and on open wire circuits of a gauge of wire smaller than No. 8 B. W. G.

The possibilities of improving transmission by loading are extremely promising; in fact, much has been accomplished already in loading No. 12 N. B. S. G. circuits and also in loading cable circuits. The loading of open wire circuits larger than No. 12 N. B. S. G. has not, however, been entirely successful, but promises to be so in the near future.

Referring again to the formula for the attenuation constant A , you see that a third method of bettering transmission is to decrease the mutual electrostatic capacity of the circuit, that is, make C in the formula as small as is possible. Now the capacity of a circuit depends on the diameter of the wires composing the circuits and on the separation between the wires. The larger the diameter of the wires the greater the capacity, and the greater the separation between the wires the less the mutual electrostatic capacity. This is one of the reasons why part of the gain in transmission which should result from the use of wires of low resistatnce is lost, due to the increase in capacity, the capacity increasing as the line wires increase in size. As the capacity decreases as the separation between the wires increases, it is obvious that transmission can be improved by placing the wires further apart. This of course

means a fewer number of circuits per pole line and consequently means a large increase in the cost of circuits to handle a given volume of business. Again, the improvement in transmission due to a separation between the wires of a circuit of 24 inches instead of 12 inches is so slight as to make it a method not to be seriously considered.

The fourth and last method of improving transmission is by increasing the shunt resistance of a circuit, or, in other words, increasing the insulation resistance. From my experience in telephone work I should say that increasing the shunt resistance, that is, increasing the insulation of the circuit, means nothing more or less than good line maintenance and good operating. I think this is one of the best methods of improving transmission on existing circuits, one that is fairly inexpensive and which if gone into thoroughly will show most noticeable results.

Inefficient line maintenance is the cause of poor transmission more often and to a greater extent than is realized. Every slight leak on a circuit provides a shunt path to keep the transmitter current from reaching the receiver at the distant end of the circuit. If the points of low insulation on the wires of a circuit do not coincide and are not of approximately the same resistance, then the circuit becomes unbalanced and noisy, which, of course, means unsatisfactory transmission.

Of two circuits composed of the same size line wires, the one which is perfectly quiet will give better and more satisfactory transmission, than the one that is slightly noisy due to leakage caused by broken insulators, trees, etc., even though a more powerful transmitter is used on the second circuit than on the first.

To obtain first-class line maintenance means a careful inspecting and testing of circuits. Regarding the inspection of circuits, do not trust the inspection to the same persons that do the maintenance work or the work of clearing trouble on the circuits, but have each circuit inspected by a competent wire chief at least once in six months and more often than that if the results of the inspection warrant it. This inspection should be carefully made, and if carefully made, it will be surprising the number of troubles found. A rigid inspection will result in finding many cases of broken or cracked insulators, many cases of loose tie wires and instances will be found where the line wires are off the insulators entirely and are lying on the cross-arm. Too much slack in line wires resulting in swinging crosses and the grounding of the wires on the other circuits of the pole line, also cases where tree trimming is necessary, will be found on inspection trips over the line. When making such inspection it is of particular importance that every soldered connection should be examined, especially at points where the circuit is bridled in and out of offices or cable boxes. At all points where the circuit is protected by arresters of any description, the circuit should be carefully examined to make sure that the arresters are not the cause of low insulation and do not make the circuit noisy.

After a thorough inspection of a line has been made and the troubles have been cleared up, you will be surprised at the improvement in transmission, especially on wet or rainy days, when, before clearing up the troubles on the circuit, it was either noisy or of low transmission efficiency, and in many cases, unfit for commercial service from both reasons.

Many cases of induction from neighboring power or electric light circuits will also disappear after a thorough

clearing up of line troubles, following a rigid inspection of the circuit, and the first thing to do whenever a telephone circuit becomes noisy due to electric light induction, is to clean up the circuit and place it in a perfect physical condition.

Besides periodical inspections, the circuit should be regularly tested by the various wire chiefs or others in charge of the circuit along its route, and these wire chiefs (I call them wire chiefs because that is the title given to such men in commercial telephone work) should be provided with the necessary instruments and facilities for measuring the insulation resistance and for the location of crosses, grounds, etc.

The regular tests that should be made by the wire chiefs, should consist of daily tests to determine that the circuit is clear of troubles, this test to be made early in the morning before the heavy business of the day commences; and weekly, or bi-weekly tests, which should consist of accurate insulation and resistance measurements of the circuit, the insulation measurements to include not only the insulation of each wire to ground, but the insulation between the wires of a circuit. The results of these tests should be carefully entered in a log book, together with an entry giving the temperature and the weather conditions at the various stations along the line. From these weekly tests a fair idea of the general condition of line maintenance can be determined, as the insulation results, considered in connection with the weather conditions, will show whether or not there is an abnormal line leakage. The resistance measurements will also show whether there are bad joints of high resistance in the circuit. In commercial telephone work, any wire

that does not show an insulation of at least 10 megohms per mile, on a clear dry day, is considered a faulty wire and the cause of the low insulation must be at once located and the trouble cleared.

The proper testing and handling of a telephone circuit in order that it may be kept in first class condition requires the services of several wire chiefs, if the line be of any great length, and money expended in this way is well spent. It is a simple matter to calculate the cost of a circuit, given its length and the number of pounds of copper to the mile, and knowing the cost, it is also a comparatively simple matter to calculate what amount it is economy to spend in the general upkeep of the circuit in order to maintain satisfactory service, and if the subject is approached in this way it will be found that a considerable sum can, with economy, be spent in obtaining the services of competent wire chiefs and on the proper maintenance of the circuit in order that it may be in the best condition for satisfactory service.

The statement was made a few minutes ago that increasing the shunt resistance of the circuit was synonymous with good line maintenance and good operating. Remembering that the shunt resistance of the circuit is simply the mutual insulation of the circuit, that is, the insulation resistance between the wires composing the circuit, it is clear that if a long circuit is in drops at a large number of places, that is, it is available for service at these places, and that when the circuit is used for long haul messages, messages between distant points, and these clearing out drops or signals are bridged across the circuit at the intermediate offices, you have an operating condition which does not tend to give a high mutual resistance between the wires of the circuit,

or, in other words, the bridged drops at intermediate offices provide shunt paths for the telephone current, and according to the number and character of the bridges, will depend the amount of current shunted from the receiver by these bridges.

Take, for instance, a long circuit that is in drops at a number of intermediate offices, say at private branch exchanges, and suppose that for messages between the terminals of the circuit, it is cut through at the private branch exchange boards by cords which contain clearing out drops, and that these cords also allow an operator to listen in on the circuit in order to supervise the connection.

Under these conditions each cord with its clearing out drop or signal, places a shunt across the line, which has the effect of lengthening the circuit by a certain number of miles, and if many such cords are in the circuit the effect on transmission becomes serious.

One of the worst features of such an operating condition or arrangement is the fact that the operator can listen in on the circuit, so that you not only have the bad effect of the clearing out drops or signals but also have a large transmission loss, due to the bridged operator's set, in many cases the loss due to a single bridged operator's set is equivalent to lengthening the circuit from fifty to several hundred miles. If many such operators have access to the circuit you can easily understand that the transmission over a long circuit will not and cannot be expected to be satisfactory.

When a long circuit is made up by connecting together several short circuits which are normally in drops at a number of different places, it means that unless a special operating system is put into force there will be several clearing

out signals bridged across the line with the accompanying transmission losses, and it also means a loss of circuit time, for if many short circuits compose the long circuit, both theory and practice prove it to be true that at least one of the short circuits will probably be in service when it is needed to make up the long circuit.

If the requirements of the service are such that a long circuit must be in drops, and available for service at a number of intermediate offices, then an operating system should be put into force which will call for the circuit to be cut through at all intermediate offices, not at the private branch exchange by the operator, but at the test board, or test panel, by the wire chief or whoever else is in charge, using a blind cord, that is, a cord without any bridged drops or other bridged apparatus.

To operate in this way, the circuit can be ordered up and down by Morse or else can be ordered up by telephone and down by Morse. Such an operating method is absolutely essential, if satisfactory transmission is to be obtained.

Another operating feature that must be considered is the use of the wires composing the circuit, for Morse work, either by means of composite apparatus, or by simplexing the circuit.

No matter which system is used, a bridge is placed across the line, wherever the composite or simplex sets are located, and these bridges cut down transmission considerably. The simplex set, which contains a repeating coil, is equivalent to lengthening the line, if it be a No. 8 B. W. G. circuit, by about 40 miles, so that you can see that a few such sets would have a serious effect on transmission. The composite set, by which is meant the composite set for a metallic circuit, is of slightly less effect in reducing transmission.

If it is considered advisable to use a circuit for Morse purposes, then for telephone messages between terminals, arrange the operating system so that when the circuit is ordered up and cut through by the wire chiefs at the test boards, the composite or simplex sets are at the same time removed, which insures a good clear circuit between terminals.

Good line maintenance and the use of proper operating methods will do much to insure satisfactory transmission, and if any of you have in your charge long circuits over which the transmission is not entirely satisfactory, may I suggest that you consider the above remarks, and see whether or not you have a remedy for your trouble in your own hands.

A method of improving transmission over existing circuits which is used to a certain extent and which also has its limitations is by installing telephone repeaters.

The telephone repeater virtually consists of a combination of a receiver and transmitter, the receiver acting on the transmitter and in that way the telephone current, placed on the line at one of the terminals, is relayed and renewed by means of the repeater. Of course, a specially designed repeater circuit must be associated with the repeater, in order that it may be actuated by telephone currents from either end of the line. The circuit used is of the Wheatstone Bridge type, and from its nature, requires that the length of line on both sides of the repeater be of approximately the same distance and of the same character. This is one of the limitations to the use of the repeater. Again, on account of cross talk between circuits on the same pole line, or in the same cable, the telephone repeater must place on the circuit a current not any greater than is

placed on the circuit by the transmitter, so that this also is a limitation to the amount of improvement to be gained by its use.

Another feature to be considered is, that while the length of circuit on both sides of the repeater must be approximately the same, there is also a minimum length that can be used, and furthermore, this minimum length must be free from bridged apparatus, or else the repeater will re-act on itself and howl.

The use of a repeater requires good line maintenance as you can readily see, and in one way it may be called a good detector of poor line maintenance, or of circuit trouble, for the repeater will surely howl if there be low insulation or high resistance crosses on a circuit in which it is used.

In commercial telephony considerable use is being made of the telephone repeater in long circuits which are expressly used for messages between the terminals of the circuit or from points beyond the terminals.

In what has been previously said the intention has been to point out some of the reasons why the existing standard instruments best met the varying conditions of commercial telephony, the necessity for having instruments that can rightly be said to be best adapted for universal use, and also there has been described some of the methods that can be employed to better transmission over existing circuits, and to extend the range of service, when a demand for it exists, between points more widely separated than at present require long distance service. I wish now to say a few words about transmitters that are more powerful than the standard transmitter, even though their use is prohibited by the nature and requirements of commercial telephony.

To begin with, I think it is well known that it requires very little ingenuity to produce a powerful transmitter. As an example of what can be done in producing a powerful transmitter, I will say that I once listened to transmission over a circuit of No. 12 N. B. S. G. wires 250 miles long, and containing several miles of underground cable, the transmitter used being one that operated on five amperes of current at a potential of 100 volts. The volume of transmission was deafening and the cross-talk on all other circuits on the pole line was such as to render them unfit for commercial service. Such a transmitter, of course, has no commercial value, and can be justly classified with a number of others of a similar nature as a freak transmitter. It is my hope that I may never again have to listen to transmission from such an instrument.

Again, I can conceive of but one or two situations that will allow of the use of powerful transmitters, and the peculiar conditions which theoretically will allow of the use of such instruments have not been met with in practice. In each case where it at first seemed as though the situation demanded the use of transmitters slightly more powerful than the standard it has been found that by improving line maintenance and operating conditions, by increasing slightly the amount of current furnished to standard transmitters or by the use of telephone repeaters the necessity for powerful transmitters has been obviated, and to my mind all of the above features should be carefully gone into and studied before even considering the use of special instruments.

I intended in this paper to describe two installations containing some features that I believed would be of interest to you and with which I have been associated in an engineering way. I think, however, this paper has already

occupied sufficient of your time; furthermore, Mr. Camp, of the Canadian Pacific, and Mr. Taylor or Mr. Van Aken, of the New York Central Lines, will be glad, I feel sure, to tell you of the Canadian Pacific dupléx circuit between Montreal and North Bay and the proposed Albany-Fonda circuit of the New York Central Lines.

The paper was received with applause.

PRESIDENT CHENERY: The interesting paper of Mr. Chetwood is before you, but it occurs to me, inasmuch as we have another paper practically on the same subject, it might be well to have the paper of Mr. Van Aken, of New York City, after which the discussion of both will be in order. We will be glad if Mr. Van Aken will present his paper. "Maintenance and Operation of Telephone Service on Railroad Company's Lines."

A comparison of the maintenance and operation of telephone service on railroad companies' lines, with the maintenance and operation of telephone service on telephone companies' lines, is necessary to a proper understanding of the subject under consideration.

The telephone company's maintenance force consists of Plant Superintendent, Division Plant Superintendent, Wire Chiefs, Battery men, Switchboard maintenance men, local trouble men, instrument installers, linemen and an Engineering Department in an advisory capacity; while the railroad company's maintenance force consists of the Superintendent of Telegraph, with possibly an assistant, Wire Chiefs whom he has picked from the rank and file, and educated for the work in connection with their other duties; telegraph companies' linemen, and, where a contract with the telegraph company does not provide that their men shall take care of

inside work, the Superintendent of Telegraph may have authority for one man to each one hundred and fifty miles of line, who can be called upon to work on telephone line test panels, and office equipment, under his personal supervision, or that of his assistant; and in some cases, the Engineering Department of the American Telephone & Telegraph Company in an advisory capacity.

A telephone company's operating force consists of a President, Vice President, General Superintendent, Superintendent, Manager, Traffic Manager, Chief operators, Supervisors, Repeating clerks and Line operators; while the railroad company's operating force consists of the Superintendent of Telegraph, Wire Chiefs and Switchboard operators.

Telephone companies maintain their apparatus and lines by men assigned to particular branches, while a railroad company having but one, or possibly two, long distance circuits, maintain the lines, and office equipment, with men who have various duties to perform.

The telephone companies have officers directly in charge of the maintenance and operation, who are interested only in telephone work, to the end that the service be maintained satisfactorily, not only to a few, but to all concerned; while the railroad companies switchboards are usually under the jurisdiction of local officials, who have other important branches of service to look after and do not realize the needs of the general telephone situation nor give proper attention to complaints of poor service, at the same time they themselves get the best of service due to the fact of their relation to it at that particular point.

Telephone companies linemen report to their wire chiefs every hour, whether on trouble orders or inspection trips,

and are not allowed to leave their stations without orders or permission. They have territories ranging from six and not to exceed eighteen miles, being located as conveniently near the center of their respective sections as possible. Repairs are not made by them, but are reported to their foremen, as they are not expected to go further than to keep the wires in actual operating condition; while the railroad company's lines are maintained by telegraph companies men whose territory will vary from thirty to sixty miles. When at outlying points they have no means of communicating with their wire chiefs, and frequently from one to five hours will elapse after trouble is reported before they are notified of it. In the absence of wire trouble, they are usually making repairs to the line, putting on guys, crossarms, guard wires, insulating, and in fact everything that can be done single-handed.

The wire chiefs of the telephone companies are in touch with their linemen and issue orders direct to them, while the railroad company's wire chiefs (except where they are joint men), are obliged to report trouble to the telegraph companies and they in turn send men out to clear it.

Telephone companies can economically maintain a large force of men to look after their larger plants, while railroad companies with but one, or possibly two circuits, could not consistently maintain a similar force, as the expense of doing so would be excessive and entirely out of the question.

Telephone companies lines are invariably constructed along public highways or on private property where tree trimming privileges cannot be obtained, in consequence of which their standard minimum insulation is ten megohms per mile in clear weather. The insulation resistance of open

line wires, on railroad companies lines will, in clear weather, show as high as sixty or seventy megohms per mile. The reason for this is that railroad companies lines are on their right of way where there is seldom any question regarding trimming rights and privileges; and thus a high standard of insulation, which is essential to good transmission can be maintained.

The practice of utilizing Wheatstone bridge measurements to locate trouble on telephone companies lines, is not employed effectually at long range on account of distributed leakage. Numerous testing points are, therefore, essential, being located on an average of every five miles, while on railroad companies lines, they are located on an average of every twenty miles and the Wheatstone bridge measurements are here effectually employed at long range, and trouble located where a high standard of insulation is maintained, the results of such tests being seldom more than three or four ohms at variance.

As parallel circuits are seldom available to patch out on railroad companies lines, it is needless to say that in case of interruption, communication cannot be restored until the cause has been removed; while on the other hand, telephone companies have various routes over which to switch their business in case one should fail: They also have parallel circuits with which to patch their most important circuits, and it is not as essential for them to hasten repairs, as it is where similar conditions do not obtain.

To successfully operate a long distance telephone circuit on a railroad company's line, the most important requisite is a Monitoring Wire Chief whose good judgment can be relied upon. It is also essential to have wire chiefs who

are both telephone and practical railroad men, and a set of fixed rules that are comprehensive and definite.

The monitoring wire chief's duties can be summarized as follows:

He should watch the lines closely for any irregularities in the service, such as line trouble, noisy connections or, unlawful use of the lines. He should see that employes are attentive to duty, that the rules and instructions for the operation and maintenance of the service are complied with, that employes are courteous in the performance of their work, and that all calls are promptly and properly establish and, no partiality shown in the matter of precedence to establish connections. He should assist in any lawful way to accelerate the service, establish morning test calls and, whenever necessary to improve transmission, place telephone repeaters in the line and, see that they are always in good condition. He should be responsible for the prompt clearing of the line of all switchboard connections on through calls, test the line to ascertain positively whether all switchboard connections, simplex coils, bells, etc., have been removed, and the line connected through at test boards and test panels before establishing the connection. He should keep a complete record of all interruptions and trouble on the line and inform the Superintendent of Telegraph promptly of such interruptions or trouble, and advise him when communication is restored. He should check the standard of insulation and resistance of the entire line at least once each month, supervising the work of other wire chiefs, who are expected to manage the offices at which they are located while at the same time they have other duties equally distracting from this particular line of thought and work.

Wire chiefs should be located at division terminals if possible, as is also the case with the monitoring wire chiefs. The latter, however, must be located at telephone repeater stations where repeaters are used, and these stations should be equipped with every convenience for the proper handling and supervision of the service.

The telephone set on a monitoring board should be equipped with a high impedance receiver so that the monitor can remain in on connections without noticeable loss in transmission; and, if a small switchboard is necessary at such a point for switching long distance connections, he should, to be in close touch with the operators and operation, handle it personally, when on duty, and closely watch the nature of the business transacted.

Where a contract exists between the railroad company and the American Telephone & Telegraph Company, stipulating that the use of their equipment and the establishment of connections from points on private lines through their switchboards is for the exclusive use of the railroad company and the transaction of its business, calls relating to private matters must not be allowed and should be immediately cut off and the parties involved notified that they cannot use the line for private business. This should be done, not only to carry out the spirit of the contract, which is sufficient cause for arbitrary action, but to insure the prompt transmission of railroad matters.

Unless this or some similar plan is adopted, calls covering private matters will creep in, operators will discriminate in favor of certain parties, allowing them to use the line in excess of the time limit, in consequence of which, waiting calls will be unnecessarily delayed, and oftentimes the line

will be held idle to establish a certain call; whereas, if it is known that a strict supervision is being maintained, this will not occur.

When there is a congestion of calls between two stations, operators will often insist on holding the line for more than a reasonable length of time, and calls waiting on other sections of the line would be delayed for hours and, if the monitoring chief is not authorized and empowered to settle disputes and questions between operators and those using the service, the situation will immediately become chaotic. One of the most important duties of a monitoring wire chief is to see that all stations have equal opportunity to establish calls.

The operating rules of telephone companies are compiled with a view to furnish the best possible service over their lines at fixed toll rates; in other words, they are in the business from a financial standpoint; and, if the service so furnished is not satisfactory, the only inconvenience they experience is that of financial loss.

The rules to govern telephone service on railroad companies' lines are compiled to furnish the best service possible with limited facilities, and to transact a maximum amount of company business.

Company business defined, relates to matters that strictly belong to the operation and maintenance of the railroad or are of interest to the railroad company; in other words, official business, which must be transacted without delay.

The demands of official business on one long distance circuit are so great, that all unimportant matters, as well as private matters, must be eliminated; as otherwise, the congestion of the service would be unbearable. If con-

ductors, engineers, brakemen, firemen and all others not directly connected with the operating department were allowed to make use of the limited service, it would be next to impossible to transact important business; and then again, their communications usually consist of personal grievances which the division officials do not care to discuss by telephone, it being detrimental to good discipline, and they are adverse to allowing employes such privileges.

To meet the demands of the service as far as possible, and transact a maximum amount of business, it will be found necessary to limit calls during office hours to three minutes, excepting those made personally by certain company officials, whose communications should be unlimited. In order to protect unlimited service calls, a list of those entitled to unlimited service and precedence should be compiled and embodied in the fixed rules.

On the New York Central Company's line between New York and Buffalo, and the Lake Shore Company's line between Buffalo and Chicago, precedence and unlimited service are accorded to the President, Vice-Presidents, General Managers, Assistant General Managers, General Superintendents, Superintendents of Telegraph, (who are responsible for the service) and Chief Engineers. These officials authorize the symbol "39" when they require immediate service, upon receipt of which, telephone operators proceed to clear the advance line of all limited service calls, and immediately establish the "39" connection.

When calls are made personally by the above named officials without authorizing "39," they are handled as "Specials," i. e., they are established next after the completion of any call or expiration of a time limit.

Immediately after the expiration of unlimited service calls, the connections that were cut off to establish them are re-established.

On account of the lines referred to being used for both short and long haul connections, the direct New York-Chicago circuit is connected into nine private branch exchanges, and at each of these points, the line is bridged with 2,500 ohm bells; and, to operate Morse over the New York-Buffalo section, the line is equipped with six No. 37-A repeating coils. The impedance offered by each of these coils is equal to about 40 miles of No. 8 B. W. G. open copper line metallic circuit.

It was impossible to obtain good transmission on the line "bridged" with bells at seven intermediate stations, and with approximately the equivalent of two hundred and forty miles of additional circuit, due to the repeating coils; therefore it was necessary to inaugurate a system to quickly clear the line of everything that would impede transmission, as follows:

The signal symbol "39" is authorized by operators and wire chiefs on all calls between points on the New York Central lines, and points on the Lake Shore lines exclusive of Buffalo. The operator at the originating station immediately clears the advance line of limited service calls, and passes the symbol, naming destination, to the advance station, and then notifies the home wire chief. Operators at intermediate advance stations immediately clear the advance line, relay the symbol and notify their wire chiefs of the "39" connection. The wire chiefs so notified, immediately acknowledge the symbol call notice to the monitoring station, and connect the line straight through at the

line jacks. As soon as the monitoring wire chiefs are in communication on all New York-Chicago calls it requires about thirty seconds to test the line between Ravena, N. Y., and Elkhart, Ind., a distance of seven hundred miles, to see that it is absolutely clear of all office equipment. If they find that some one has failed to connect the lines straight through, which is very seldom the case, it may take an additional one minute to remove the remaining equipment. Assuming that the line is found to be clear, they immediately notify the originating and terminating stations to proceed, and at the same time insert the telephone repeaters in the line. To follow these instructions to the letter, and establish a call between New York and Chicago covers a period of about six minutes, and the quality of transmission is dependable.

Reviewing what has been said with regard to establishing through calls on our New York-Chicago circuit, it will be seen that all difficulties due to the "bridging bells" has been removed, that the line has been shortened, approximately, two hundred and forty miles, by the removal of the simplex coils, and, as the two sets of telephone repeaters are equivalent to three hundred and sixty miles gain in transmission, that the total of nine hundred and seventy railroad miles is reduced to six hundred and ten open line transmission miles.

After a through "39" call is completed, the monitoring wire chiefs (who are monitoring the service at the repeaters), immediately notify all intermediate wire chiefs, by Morse, that the line is released from the through service. The intermediate wire chiefs watch a designated wire until the notice of release is received, whereupon they connect all

equipment normal and notify their switch board operators accordingly. The telephone circuit is invariably cleared and placed in local service in the insignificant period of thirty seconds.

Referring to the local operation of the line that all stations may have equal opportunity to establish calls, a ruling is enforced that no two stations, under equal conditions, shall be allowed to hold the line to establish more than six calls or for a time period of thirty consecutive minutes. Unless the use of the line is so limited, it would be impossible to transact business between all points, without protracted delays at one point or another.

From the above comparison of the maintenance and operation of telephone service on telephone companies' lines with an experienced adequate force in each of it's branches, and the maintenance and operation of telephone service on railroad companies' lines with a force who have combined duties to perform, it will be seen that the latter is a complex proposition.

Telephone service on the New York Central lines was proposed in 1902, authorized in June, 1903, and the line construction completed December 3d, 1904; but the quality of transmission obtained between New York and Chicago was very unsatisfactory up to August, 1906.

Established precedent in the operation of the line was the principal cause for much of the confusion and difficult transmission experienced previous to this date; the radical departure outlined above has brought about the present satisfactory conditions.

Good results can be anticipated by operating similar lines in a like manner, as some of our people are of the

opinion that the transmission and service over the railroad companies' private circuit between New York and Chicago is twenty-five per cent. better than can be obtained between the same points on commercial lines.

The paper was received with applause.

Mr. Williams: If there are any other papers on the same subject I ask that we have them read and discuss them afterwards.

President Chenery: I believe they are the only two papers on the telephone question. A great many of the members are interested in this matter of telephone service on railway lines. On the road I represent our people have thought they would like to connect the general offices with the larger terminals and division offices. We haven't as yet found the money. An account of the efforts of the N. Y. Central people, who are the pioneers, perhaps, in long distance railroad telephony, will be beneficial to the balance of us when we reach that point. The two papers are now open for discussion.

Mr. Selden: I have anticipated that sooner or later the telephone service must come. I suggest that it might be well to bear that in mind. It wouldn't cost much more if you never used it. There is a sort of reciprocal arrangement, not only for cables, but office equipment, and I am satisfied the telegraph company would be glad to meet you on that point, because I have known of their doing so already. I do not think that the W. U. now order any cables but what contain a number of pairs of telephone circuits.

Mr. Camp: I might say in response to Mr. Selden's remark that the point is well taken. We have a number of composited telephone circuits, and in order to overcome the

induction we have had to put up aerial twisted pairs between the telegraph office and the general offices. We are now putting in another cable with twisted pairs to provide for telephone circuits or circuits on which we work the telephone.

Mr. Rhoads: On a N. Y. C. line they operate thirty-seven miles of road, with an average of thirty-six trains a day, by telephone without any operator, having the phones where the train men can take their own orders. Possibly some A. T. & T. man here is familiar with that. Regarding the question of joint cables, I think, personally, the telephone is of such importance that we should have separate cables, so in case you have lightning trouble on one system it does not mix with the other. You always have one clear.

Mr. Groce: We constructed the Indianapolis Southern using the telephones for handling trains, and we did not have any trouble in six months, but in that period there had been several quite serious accidents in the United States and the management were getting a little scared. While we felt it was safe, we felt it was a new departure. We were severely criticised and for that reason we changed to the telegraph. With the telephone system the Illinois Central has had some experience as long ago as 1901, I think. We had nearly a thousand miles of metallic circuit. They changed the line on one division, seventy-five miles, to telegraph. In going over the whole situation some time ago it was suggested the line might be improved by making an arrangement with the Bell Company to take our lines into their boards. The telephone company having facilities for testing, etc., could better handle the lines and could better certain parts of the service, and it would do away with

the necessity for our having many high-priced men. Before I came away the arrangement had almost been completed.

President Chenery: It might be interesting to the members, as we all have in mind the use of the telephone on some branches, if you would specify the distance of this Indianapolis Southern, how many stations, etc.

Mr. Groce: The line is eighty-nine miles. Regular train service was carried on between Indianapolis and Bloomington, Ind., about fifty-six miles. There were a great many work trains, and as you know, work train service makes a good many train orders. There were a number of orders handled every day, and handled precisely as by telegraph. The despatcher had a telephone on his desk. We fixed him up with this arrangement you tie over your head, so he could keep up his train sheet, give his orders and all the information that would come from a despatcher, and it worked all right.

President Chenery: How many stations?

Mr. Groce: I think, five stations between Indianapolis and Bloomington.

President Chenery: Were your agents at these points telegraphers? Had they been accustomed to handling train orders by telegraph?

Mr. Groce: Most of them had; yes, sir.

Mr. Taylor, A. B.: How long in operation?

Mr. Groce: I think we operated it about six months.

Mr. Ryder: We were constructing a line about sixty miles long and the original plan was to use the telegraph but before we got ready to start in the suggestion was made that we try the experiment of using the telephone,

and that experiment was continued not only during the building of the line of the road, but for nearly a year afterwards. Mr. Groce referred to the amount of work, train orders, etc., resulting from work train service. We all realize what that means. We used the telephone and never had a particle of trouble and handled everything from train orders down. It was finally found advantageous by reason of local conditions to operate this piece of line telegraphically instead of telephonically, this change doing away with the telephone dispatchers otherwise necessary. In making the change the new line, which was over a hundred miles from division headquarters, was simply hooked on to the old telegraph line to headquarters, making the telegraph dispatching circuit simply that much longer. This change was dictated entirely by economical reasons, not by any dissatisfaction with the scheme of telephone operation..

President Chenery: In your opinion, do I understand, Mr. Ryder, on branch lines you see no objection to handling trains by telephone?

Mr. Ryder: I certainly do not, if you have a first-class telephone circuit; none whatever.

Mr. Camp: The Canadian Pacific is now doing some construction work, and during construction communication is kept up by telephone. We have work under way of 220 miles, and in all cases we are using two wires put up for telegraph purposes as telephone circuits during construction. I believe they give every satisfaction. But we haven't got to the point of using telephones in the operating department, although our vice-president is very much interested in the work and has before him the proposition of converting several branch lines into telephone operation.

President Chenery: I think the experience of us all is on the same line. We have in the past few years built a number of miles of railroad, and, as Mr. Camp stated, in all cases we used the telephone until turned over to the operating department. We, however, were not so fortunate as to have two wires in all cases. We were satisfied if we got the one and used a grounded circuit.

Mr. Cellar: I see Mr. Ryder is trying to get out, and I want to ask him before he goes to what extent he blocks trains by telephone on the Burlington.

Mr. Ryder: During the past two years and a half the Burlington has done a good deal in the way of block signaling and has used the telephone exclusively as a means of communication in that service. Recently we have abandoned the telegraph on our old block circuits and now use nothing but the telephone for such communication.

Mr. Davis: I want to ask Mr. Ryder, do they do it on the main line or does this apply only to yards and branches—short distances? I want to know whether there is any instance where the telephone arrangement takes care of high speed movements.

Mr. Ryder: The service I mentioned covers the main line east of Lincoln, and covers all classes of service.

Mr. Selden: I understand they block entirely by telephone outside of Boston.

President Chenery: I will ask Mr. Kaiser, who is familiar with the question, to explain it.

Mr. Kaiser: All trains a distance of eleven miles outside of South Station are handled by telephone. The last figures I had from the Ast. General Superintendent, showed

they were handling 780 passenger trains in and out of South Station daily, or a total of 1,800 passenger and draught trains running out of that station, and that includes the N. Y. N. H. & H. and the B. & A. Between 5:15 and 6:15 there is a total of 90 trains in and out. All of which are handled by telephone.

Mr. Rhoads: By looking at the Railway Guide you can readily see that the movement of trains by telephone is nothing new. I presume between now and the afternoon session you can see how many miles are operated by telephone in the United States, in distances ranging all the way from nineteen to one hundred and twenty-five miles. The impression we started in with that the telephone arrangement for handling trains is something new and experimental, I think is a wrong impression. The first thing the Chicago & Ind. So. did was to arrange for a metallic circuit for a telephone system to operate their work trains while building the road.

Mr. Selden: I think this matter would be a good thing for this committee appointed last night to arrange for.

Mr. Cellar: I would like to ask somebody that has had experience with blocking trains by telephone on congested track what the result is. I have heard the project criticised in this way, that the telephone is too slow.

President Chenery: I think the suggestion made by Mr. Selden is a good one, that the committee appointed last night handle this matter, or a new committee to be appointed, to formulate data with reference to handling trains on the several roads by telephone, and have it ready for presentation between now and the quarterly meeting, if you please. What would be your idea, Mr. Selden?

Mr. Selden: That committee could serve in that capacity. I should think it right in line with what the committee was appointed for.

President Chenery: The same general committee. We want to get that report very early. I think it would be well to let it be understood now that the same committee that was appointed last night also take up this matter.

Mr. Selden moved that the committee appointed last night on telephone matters, also take up the question of handling trains by telephone,

Which was seconded,

And agreed to.

President Chenery: I think there is no question but by such means you will probably get more information and secure more data of value, than by a general discussion, which does not arrive at any particular end.

Mr. Taylor, A. B.: I think, if Mr. Chetwood could give us some interesting items, that would help this committee.

Mr. Chetwood: The work we have been doing for the New York Central lines consists in designing a special combination of transmitter and receiver, mounted on a specially designed arm, such that a tower man when receiving a telephone message from the train dispatcher does not have to place or hold a receiver to his ear, and therefore has both hands free to write down orders, and also when leaving the telephone set he does not have to remove a head receiver or hang up an ordinary receiver. The receiver itself is a specially designed one to meet the requirement that as large a number as twenty tower sets may be bridged on one circuits and all sets receive satisfactory transmission. In other words, the receiver is one of high efficiency and also

one that does not introduce a large transmission loss when bridged across the circuit. Besides the above, we worked out the circuit wiring to be used at the towers and at the train dispatcher's office, the wiring at these places being designed to meet the requirements and conditions which Mr. Taylor and Mr. Van Akin specified. The apparatus referred to above has been about completed, and will shortly be installed between Albany and Fonda, where there are, I believe, approximately twenty towers, and a practical test of this apparatus for train dispatching will then be made.

Mr. Cellar: May I repeat my question to Mr. Ryder as to whether he finds any difficulty in the matter of slow action of the telephone block?

Mr. Ryder: No, sir; we do not.

Mr. Groce: In connection with the special instruments designed for the N. Y. C., our experience has been that there is an advantage in getting away from the desk set; that is liable to fall over and break, and I would suggest that any kind of a device that is more liable to be fixed has an advantage over the movable phone. I imagine they have made that suggestion. I understand that has been done. It may be that they can get some device directly that will do away with the operator and solve this vexed question of scarcity of men.

Mr. Taylor, J. B.: In my experience when talking to or from a telephone in a signal tower, when I started to talk somebody would say: "Wait a minute until this train passes." Considerable time is lost that way. I want to ask if external noise is much of a factor in the use of the telephone for block working.

Mr. Van Akin: We have arranged to put in automatic cut-offs, so no noise can get in.

Mr. Camp: Referring to the arrangement for cutting off transmission, why not have this little switch operated by the foot? We have a telephone in our operating room, for convenience on the chief operator's desk, and in order to prevent noise interfering with his receiving we have a small floor button on which he places his foot when listening.

President Chenery: I would suggest this afternoon, in addition to some papers, the writers of which are present, that we take up—perhaps, it would be advisable to first take up the report of the Committee on Wire Legislation, of which Mr. Groce is chairman. This matter was the foundation for our monthly meetings in Chicago and St. Louis. While we have been successful in securing legislation covering wire crossings in some states, the field is not yet fully covered. We want to thresh that matter over thoroughly. I believe Mr. Groce is prepared to make his report.

Mr. Rhoads: In looking over the figures in this guide (Railway) I find there are now 4,757 miles of roads now operated by telephone.

President Chenery: Certainly interesting information.

Mr. Rhoads: Of course, some are electric lines, and where they have trains at least every hour handled by telephone.

Mr. Camp: I might say in the first place it was principally through the kindness of the railroad department or the Bell Telephone Company that we have been able to successfully operate our circuit. The conditions are these: Amongst other wires on our overland system we have two

copper wires between Montreal and Winnipeg, each 210 pounds per mile. We transposed these wires every half mile, taking as our guide the pole nearest to the mile board for the first transposition and approximately half way between there and the next one. The distances are: From Montreal to North Bay, 360 miles; North Bay to Fort William, 635, approximately; Fort William to Winnipeg, 427 miles. We have repeaters located at Fort William, 997 miles from Montreal. Previous installations, I believe, on two duplex wires was only effective between terminal points, for instance, between Montreal and Fort William, and the difference in this system was that we required telephone communication between the general offices of the company at Montreal and the general superintendent of the Lake Superior Division at North Bay, and did not desire to increase the expense of operation and maintenance of our duplex lines by installing sets of repeaters at that point, which would not only increase the expense, but cut down our transmission on the duplexes. Perhaps the best illustration I can give you of the successful working of the telephone is to relate what occurred when I put the circuit into operation. As soon as I tested it out with North Bay and found it satisfactory to my mind, I went to the Vice-President's office and asked him if he would like to try it. He came down at once to the Traffic Manager's office where the telephone was located. He called up and asked if Mr. ——— would step to the phone, which he did. "Hello," "Hello." "Is that you?" (The General Superintendent.) "What about that engine?" He had been trying for two hours and a half or three hours to get information by telegraph about an engine and he got it in five minutes over the telephone circuit. He was able to talk over that circuit, a distance of

360 miles, as satisfactorily as from this room to the other end of the hotel. The telephone, I am informed, is in use from 100 to 150 times a day, and when one of these wires is interrupted it is not very pleasant around our office. I can assure you.

We attempted to instal a further section from the General Superintendent's quarters, at North Bay, to White River, a distatnce of 330 miles, but found it affected the duplexes. I might say the duplexes have also been working without interruption.

There is one point in connection with this that was a great surprise, not only to myself, but to others, and that is the fact that on the same line of poles and throughout the entire distance between Montreal and North Bay, and for eighty miles beyond that, where the line branches out, we had another copper wire on which we are working a phantoplex circuit. It was expected when we put in the telephone we would have to abandon the circuit or arrange for some system of switching in and out, but we are able to work both systems day after day. There is one drawback to telephone communication, and that is, on the approach of a lightning storm within 100 miles of North Bay or Montreal we have to disconnect our telephone apparatus.

Mr. Selden: The two duplexes were working separately?

Mr. Camp: Two distinct duplexes. In fact, we have five duplexes working. The duplexes used in this connection are specially designed by the A. T. & T. Co. It is the bridge system, the bridge formed by a double retardation coil, the split taking place in the middle of the retardation coil and the relay connected across the terminals.

Secretary Drew presented the name of Henry W. Sperry for associate membership and moved his election,

Which was seconded,

And agreed to.

Mr. Camp moved the convention adjourn.

Which was seconded,

And agreed to.

SECOND DAY—AFTERNOON SESSION.

(Thursday, June 20, 1907.)

The convention was called to order by President Chenery at 2:30 P. M.

President Chenery: I believe as a starter this afternoon it would be proper to hear the paper by Mr. G. A. Cellar, entitled, "Experiments with Concrete Telegraph Poles."

Mr. Cellar read the following paper:

EXPERIMENTS WITH CONCRETE TELEGRAPH POLES.

By G. A. Cellar.

The invention of the electric telegraph created a demand, which has become universal, for a form of structure to support aerial wires to be used in the transmission of intelligence; and that demand, which came, secondarily, through the failure to operate the telegraphic circuits under ground, created an industry which has expanded to colossal dimensions.

A pole for the support of wires may be defined as a column, fulfilling in this purpose support against downward pressure; also a beam, fixed at one end and loaded at the other. In its capacity as a support for wires, it is subjected to pressures downward and laterally, and to more or less of torsion. But to fulfill the requirements for such a support as this, necessitates a medium having, first, a moderate strength against compression; second a superior resiliency; and, third, long life in contact with the soil.

In the first days of the telegraph, the pole of wood was found to be far the cheapest medium for use in the support of wires, and, in the earlier days of the telegraph and later of the telephone and electric light and power, many different varieties of wood were used, varying with the native product of the different sections of the country as that product met requirements for resistance to destructive agencies encountered in the different localities. These requirements were found in greater or less perfection in the native timbers in many parts of the country, or in timbers that required transportation for only a short distance.

The chemical action of the ingredients of the various soils is largely responsible for the shortening of life of the timbers in contact therewith. Consequently, in some soils, timbers will deteriorate very much more rapidly than in others, and vice versa. Therefore, the use of timbers, especially those that are native, or whose habitat is in a reasonably near vicinity to the place where they are to be used, is consistent with the greatest economy.

The Arbor-vitae, or Northern Cedar, (*Thuja Occidentalis*) combines reasonable strength with resiliency and with the almost ideal tapering form necessary to afford the maxi-

mum strength at the point of greatest pressure under varied stresses, viz.—the ground and water line. This has accordingly been for many years the generally accepted and generally used timber for telegraph, telephone, light and power lines throughout the country, where the transportation charges would not so add to the initial cost as to make the total prohibitive, or exceed the cost of some only slightly inferior native timber.

Throughout the middle east, parts of the Ohio Valley and in other localities, the Chestnut is plentiful, and has quite a long life in contact with the soil. Its form is not nearly so perfect as the White Cedar, but it far exceeds the latter in strength to withstand lateral stresses, although its length of life is inferior to that of the Cedar, except, perhaps, in the regions where it is native.

On the Pacific Coast, sawed red-wood posts have been and are still in use; and in Mexico various timbers are utilized, the process being to cut a piece of timber with rectangular section, diagonally along its broad side, from near one side at the one end to near the other side at the other end, making of such section two posts, each of large base and small top. This form of support has also been used in the construction of steel supports, by halving I-beams in the same manner.

The Northern Cedar, as a proposition for the supply of the immensely extended telegraph, telephone, light and power lines, has passed the safety line as a resource. The Western Cedar, of which there are immense quantities, is so far away that the transportation charges make the price per pole almost prohibitive for ordinary purposes. The Chestnut, considered as a supply for its native region, is to

be depended upon for the immediate future, but is sadly inadequate as a supply for the whole country. Therefore, the mind instinctively turns to a manufactured article which shall take the place of the natural, and the logical time when the manufactured product shall so take the place of the natural is when the former can be produced as cheaply as the latter.

Into the question of cost enters that of length of pole life. Heretofore, the advisability of using a wood preservative to reduce or prevent the decay of the wooden poles has been considered from time to time, but the practice has not been largely established, because

- (1) The pole prices have been very low.
- (2) The increased life has not been found to be commensurate with the additional expense of treating the pole in its entirety.
- (3) In the building of many lines, the outlook has contemplated only moderate increases in facilities, whereas, in many instances, time has demonstrated that very much larger poles soon or later become necessary, and, therefore, the process of deterioration only serves to take down many small lines that would have to be taken down anyhow, in order to make room for larger-capacity poles.

The principal point of decay in wooden poles is at the ground and air line, where the alternate drying and dampening induces a condition of decay which grows and grows and frays away the body of the pole until it is so weakened that it has to be reset or replaced. On the lines of railroad along which a great proportion of the telegraph lines of this country are located, the unoccupied portions of the rights-

of-way are kept in turf, with a view to presenting the best possible appearance, and, consequently, are subject to grass fires, especially in dry seasons, which are dangerous to standing dead timber, particularly to telegraph poles where the decayed portion at the ground line has become like tinder. Were it not for the increased liability to ignition, the application of coal-tar to the poles, for a sufficient distance above and below the ground and air line to resist the inroads of decay, would materially lengthen the life of the pole and, while this process is all right in sandy, desert countries, the grass fires in other territory preclude its general use.

Having the solution of the question of pole preservation much at heart, the writer, through the courtesy of the gentlemen of the Engineering Department of the Pennsylvania Lines west of Pittsburgh, some years ago made some rather comprehensive investigations into the matter of a preservative best suited for telegraph pole uses, and, casting aside the proposition to treat the whole pole as too expensive in proportion to the benefit thus derived, we decided (on account of the short time until certain construction work had to be started) to undertake a compromise, by applying the preservative only to that portion of the pole extending one and a half to two feet on either side of the ground and air line. That the result justified the expense, is borne out by the present condition of the poles so treated as well as by the result of the experiments by the Forest Service, Department of Agriculture, shown in the report by Mr. Henry Grinnell, Assistant Forest Inspector (reprinted from the Year Book of the Department of Agriculture for 1905), on prolonging the life of telephone poles, and describing the experiments in several methods of treatment, from which

he adduced the conclusion that, while the lapse of time since the applications were made had not been sufficient for a full report, the method of treatment, consisting of applying the preservative to the pole by brushes, was so cheap that it would certainly repay its cost by an increase of only eight months in the life of the pole. I had not until recently seen this report, and did not know of the experiments, but, confirming, as it did, the results of my own trials, I feel encouraged to think that, under present price conditions, so long as we continue to use poles of wood, we shall certainly find in the increased life of the pole ample remuneration for similar treatment with any good preservative preparation, and especially one of antiseptic qualities.

The foregoing tends to show that the comparative price of the native woods with that of the manufactured pole is subject to considerable of a sliding scale, as the life of the wooden pole is of short duration, as compared with the estimated life which a manufactured article of perfect proportions should have.

In looking to a product which shall be the acme of structural possibility, the object will be to secure an architectural fabric that will last forever, and a Pittsburger instinctively feels that the first and best medium for the manufactured article will be steel. But consideration develops that the length of life of steel, without adequate preservative agencies, is not much greater than the long-lived woods. A great many patterns of steel poles have been made, but probably very few of them represent our practical desideratum. Among them are the poles cut from I-beams, referred to above; tubular poles made of pipe jointed together; tubular poles of special design and manufacture; poles made of plates bolted together; poles of angles fastened together

by lattice-work, and sundry other forms. But thorough study of the matter brings the conclusion that, to have sufficient long life for consideration, the inside as well as the outside of any steel pole open to the air must be accessible for the purpose of inspection and reapplication of preservatives.

So far as the writer has ascertained, the preservation of steel imbedded in properly constructed concrete is perfect. Concrete not only does not disintegrate, but hardens and improves with age. Therefore, a structure of reinforced concrete has a life that is practically unlimited, and a telegraph pole made of reinforced concrete ought for many generations to endure and answer the purpose for which it is erected. The location of pole lines along railroad rights-of-way will in the future permit the use of shorter poles for supporting the wires nearer the ground than has been practicable heretofore, because the rights-of-way of the railroads are better policed now than in the past, and in the future will be much more safely guarded. The time will soon come when persons not employed on the railroads, or whose duties do not require them to be on railroad property, will not be allowed on the rights-of-way of any railroad company. In England and on the Continent, where trespassing is not permitted, it is the practice to use very much shorter poles and place the wires nearer the ground.

The use of concrete for the manufacture of telegraph poles is not new. As nearly as I have been able to ascertain, the first concrete poles were designed by Col. G. M. Totten, Chief Engineer of the Panama Railroad Company, at a date uncertain, but probably about 1856, the road having been put into operation in that year. These poles were con-

shaped, twelve feet long, with a diameter of from twelve to fifteen inches at the base and from six to eight inches at the top. The wires were supported by iron brackets, which were fastened to the poles by wrought iron bands passing around them and around the poles near the top. The proportions of the ingredients used in the manufacture of these poles is not obtainable, but the strength to resist strains was so inadequate that means were sought to overcome this fault, and the poles were a few years later replaced from time to time by the first reinforced concrete poles of which record is known, the reinforcement consisting of 3x3 inch pine cores, extending throughout the length of the poles. The concrete poles, it is understood, were used because the available wooden poles were very short-lived, by reason of the ravages of insects. The poles with wooden reinforcement evidently were not attacked by the ants soon enough to prevent the cores from swelling and cracking the concrete, so that the first pattern of reinforced poles was not an appreciable improvement over the solid pole. After being used for a few years, the disruption of both classes of poles was such that they were practically abandoned, they having been replaced as occasion required by other patterns until, in 1888, there were only about twenty of the original poles standing, one or two of which still remain erect on the line of that road.

The "Geological Survey of Ohio," 4th Series, Bulletin 2 (1904), entitled "Uses of Hydraulic Cement," by Prof. Frank Harvey Eno, of the Ohio State University, presents in an article entitled "Cement Telegraph Poles," an item of some interest, describing cement butts for wood poles that have rotted off, observing that when a pole has to be replaced, often only the part setting in the ground has de-

teriorated, and, while in some country districts the pole may be cut off and reset, there are many poles that must be replaced altogether, thus losing the most of the pole. To meet this contingency, a cement base has been devised, octagonal in shape, with four iron strips bolted to opposite faces, extending a foot or more above the concrete. In installing this concrete base, the rotten pole is sawed off, the lower end swung a little to one side, the cement base put in the place of the rotten stump and the pole is then swung into the socket formed by the iron strips, and securely bolted. The pole when thus equipped is alleged to be better than new. In restumping in the manner just outlined, no wiring need be touched nor telegraph communication interfered with in the least. Another feature of the use of these cement butts is, that when a pole has deteriorated beyond the point of usefulness, and has to be replaced, a pole five feet shorter can be furnished, thus materially reducing the cost. The above-mentioned article states that these butts had been in use for three years, and were giving good satisfaction. The practice of restumping is largely followed in the present day, except that stumps of wood are used instead of those of concrete.

The "Cement and Engineering News," for August, 1902, mentions with strong approval the cement butts manufactured at Battle Creek, Michigan, giving about the same points stated above, and estimating that a saving of from thirty-five to fifty-five per cent. is realized by the use of these butts in reconstruction.

Mr. Robert A. Cummings, Member A. S. C. E., a Consulting and Constructing Engineer, with offices in Pittsburgh, Pa., made, in 1903, some experimental concrete telegraph

poles at Hampton, Va., and found them to be quite satisfactory for ordinary purposes. The cross-section was that of an equilateral triangle with 12-inch sides at the bottom of the pole and 6 inch sides at the top. The poles were thirty feet long, and were reinforced with three-fourths inch vertical rods at the corners. They were stiff enough to support their own weight a span of about twenty feet. At that time, Mr. Cummings had not seen any concrete poles in actual use, but said he had designed some large distributing poles for the New York Telephone Company.

Mr. McDonald, Chief Engineer of the Nashville, Chattanooga & St. Louis Railroad Company, wrote, under date of January 22, 1906, that he had used concrete poles five inches square at the top and eight inches at the bottom, thirty feet long, for supporting warning straps, or ticklers, and that they have given such satisfaction that he has adopted them as standard for that purpose. The most satisfactory results were derived from these poles by attaching pipe cross-arms, and no deflection at the middle ordinate of the pole was discernible.

The United Electric Railways Company of Baltimore has used cement trolley-poles with good results.

Mr. Alexander Crawford Chenoweth, of Brooklyn, made in 1906, some cement poles sixty feet long and fourteen inches in diameter, calculated to withstand a direct pull of eight tons and a torsion from a yard-arm four feet long equal to four tons. These poles, erected in place, cost two dollars and a half a foot. They were built to carry a four inch cable, high power direct current transmission, the spans being five hundred feet.

Mr. J. B. McKim, Superintendent of the Western Division of the Pennsylvania Lines West of Pittsburgh, made and set up last year in the line along the Pittsburgh, Fort Wayne and Chicago Railway near Maples, Indiana, fifty-three concrete poles of very graceful proportions, in which the method of reinforcement used differs essentially from any other of the poles referred to herein. These poles are small in section and approach the minimum in weight. They have thus far given entire satisfaction and show no evidence of decay.

A notable example of recent construction of a pole of mammoth proportions is that of the reinforced concrete tower for the West Penn. Railway Company's transmission line spanning the Monongahela River at Brownsville, Pennsylvania. This structure, which is one hundred and fifty feet in height, supports cables through a span of one thousand and fourteen feet, crossing the Monongahela River. The cables are attached at an average height of a hundred and five feet from the base of the pole, which is backed up by a shorter structure of the same construction, used as an anchorage tower. Both towers were designed as cantilever beams, and are mentioned as examples of how these erections are extending. The details of construction are outlined by Mr. F. W. Scheidenhelm in the issue for May 2, 1907, of the "Engineering News," who designed and constructed the towers.

After a somewhat extensive series of experiments made some time since, Mr. J. L. Weller, Member of the Canadian Society of Civil Engineers, and Superintending Engineer of the Welland Canal, built and erected a power line along the Welland Canal, using reinforced concrete for the manufacture of the poles. The poles in this line stand from

forty-five to seventy feet in height, and were designed to withstand a horizontal pull at the top equivalent to two thousand pounds. These poles have been standing in the line for more than three years and are apparently in good condition. I am informed that Mr. Weller also built a line of concrete poles forty to sixty feet in height for the Niagara Falls Power Company, and a line twelve miles long, from Decow Falls to Welland, for the Hamilton Cataract Light, Power and Traction Company, the poles running from thirty to forty feet in height above the ground. Short, heavy stubs are used to carry the line over the gorge at DeCow Falls, and poles sixty-eight feet high carry the span of four hundred feet crossing the Welland River. The latter are erected in the center of square concrete piers on pile foundations, and are capable of standing an immense strain. He also made a pair of concrete poles one hundred and fifty feet in height for the Lincoln Electric Light and Power Company, to carry that company's wires over the old Welland Canal at Lock Three, St. Catharines, Ontario. These poles are eleven inches square at the top, thirty-one inches square at the base, and weigh about forty-five tons each. They were made, not built up from the base like the towers at Brownsville, Pa., above referred to, but horizontally on the ground, and, as is the practice with wooden poles, raised into position. Of course, their extreme height and weight made it necessary to use special apparatus for their erection. Mr. Weller's processes of reinforcement are covered by patents.

Recurring briefly to the relative merits of the reinforced concrete pole as compared with the wooden pole restumped with concrete above referred to, it is thought that, while quite a considerable output of the latter have been manu-

factured and used, unless some more secure arrangement for uniting the two parts in the restumping process shall be adopted, and one that can be secured at a low cost, this solution of the problem of supplying a substitute for the wooden pole will not be a lasting success. Another point that may be cited as against the use of the stumped pole is, that the greatly increased cost by reason of putting on a sufficiently stable brace, will not be justified by the short additional life secured for an old pole by the restumping process.

Some of the problems confronting the initial manufacture of concrete poles were,

- (1) Shall the poles be made of such dimensions as to necessitate a concrete foundation, or of such size and shape that they will be securely held in ordinary earth by thorough tamping?
- (2) Shall they be made in a yard and then distributed, or shall the materials be transported to the various locations in which the poles are to stand and the poles be made there?

The experience of late years on all lines of railroad is, that the expansion of track and other improvements have made it necessary to move to new right-of-way lines so many telegraph poles that, in planning for a pole of infinite life, it would be better, if possible, to procure a type which would be secure without the foundation which would render its location when once set up a permanent fixture, and this type would be preferable to the fixed type.

- (a) Because of its smaller cost to construct;
- (b) Because of its smaller cost to set up in the line, and

- (c) Because it will be easily removable to a new location.

The second question was decided in favor of the manufacture of poles in yards, because their construction at the points at which they are to be set involves the transportation to these points of not only the solid materials to be used in their manufacture, and shelter for these materials, but **also the water, which is not ordinarily available, and the forms.** In fact, a very considerable additional physical property in the crude materials proportionate to the smaller sum total of the finished product.

On busy railroads, construction at the point of setting would involve the assembling of the apparatus on a car, the use of motive power, and the obstruction of the main track to a certain degree. This being the case, the alternate plan does not require any more apparatus or crew, will not require the services of a locomotive and crew as long, or for any longer time than the plan of making the poles at the place where they are to be set up; but it involves in addition, perhaps, the use of a derrick to be mounted on a car, the beam of which shall have sufficient radius to reach the line on which the poles are to be set. The procedure to be followed would then preferably be to manufacture the poles in a yard and have them thoroughly seasoned there before moving. In preparing for distribution, they should each be tagged or otherwise have a designation or location attached to each one, indicating the exact site in which the surveyor or inspector has designated each to be set on account of the necessities for grading the line. The poles should then be loaded by the use of the yard derrick or a derrick car, be taken out by a

train, and by the crew of the derrick set up in their permanent places in the line, in holes previously dug for their reception. This plan will require very little if any more obstruction of the main track than the stoppages requisite for the unloading of seasoned cedar poles.

On this basis, we proceeded to make experiments, first in design, and later in various and many patterns. In the working out of the plans for the requisite strength with the minimum of weight, the two hollow poles referred to in detail hereafter were made. The results of the tests are given in this paper as an example of progress, and are not to be taken as the best form for adoption, but quite the contrary. One of the patterns was square in section, with the corners chamfered off; the other, octagonal in section, and the hollow space extending from the base for about two-thirds of the length of the pole, the upper third being solid, and the walls of the lower two-thirds being from $1\frac{3}{4}$ inch to 3 inches thick. These poles weighed approximately thirty-five hundred pounds, and were calculated to withstand any stress in any direction that could possibly be improved upon them by a line of fifty wires, each wire coated with sufficient ice to make it one inch in diameter. The test was made in connection with two carefully-selected cedar poles of the same length (30 feet), and all were set in concrete, the bases being 3x3x5 feet deep.

Just within the outer surface, the walls of the concrete poles were reinforced with iron rods, which consisted of four three-quarter inch round bars, each twenty-four feet long and four five-eighths inch round bars of the same length. The poles were eight inches in diameter at the top and thirteen inches at the base, having a taper of one

inch to each five feet. Galvanized iron steps were screwed into wooden blocks moulded into the concrete, and holes were left for through bolts for supporting the cross-arms. The cross-arm braces were attached to the arms by through bolts in the same manner and fastened to the poles with ordinary lag bolts driven into wooden plugs which were placed in the concrete at the proper places. The concrete poles were set to a depth of five feet in concrete with the two white cedar poles of practically the same dimensions, and, after standing long enough to permit the cement to become solid, they were tested in turn in the following manner:

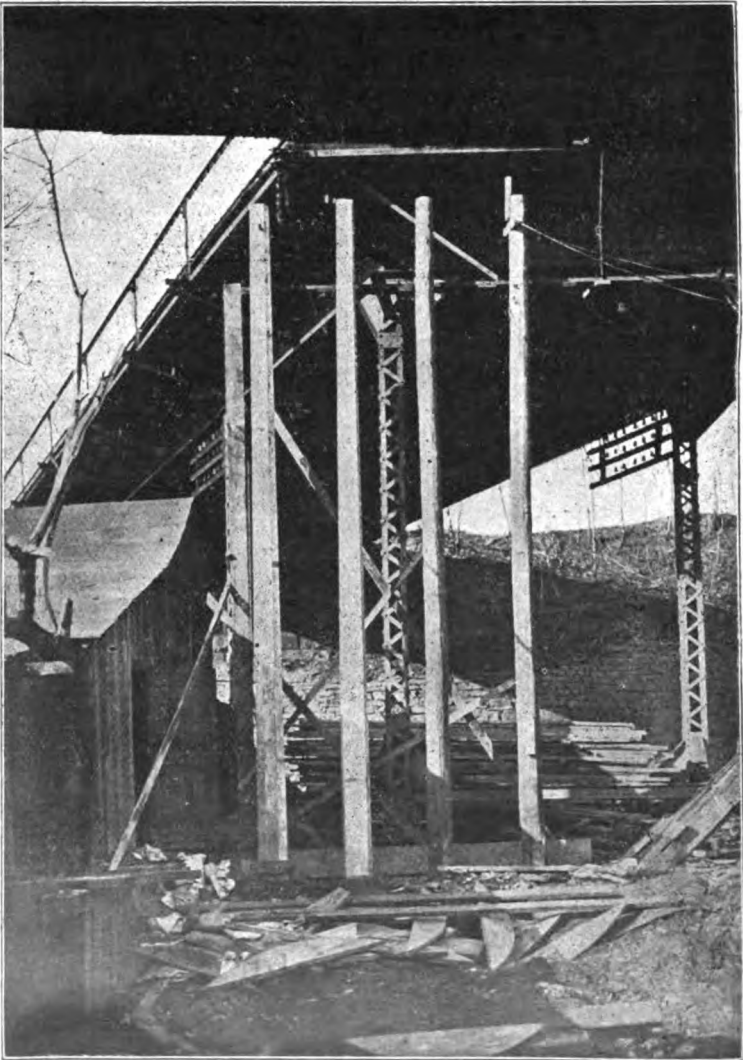
An iron clevice was placed around the pole to be tested ten inches from the top, to which a wire rope was attached, leading over a pulley placed at the same height and at an equal distance from the pole so as to form a right-angle, and fastened to a differential pulley-block which was attached to a laboratory weighing machine.

The results are fully shown in the following tables, and in the accompanying blue prints and photographs.

After the cement poles had been broken, the reinforcement so held them that it required almost the breaking pressure to further deflect them from their slightly inclined position. The wooden poles, under strain, presented the form of an arch before breaking, and when they gave way were fractured completely; but these features were lacking in the cement poles, which were very firm and did not give until they began to crush at the ground line.

The mixture used in these cement poles was 1—3. They were constructed in cold weather, and, through some mischance, at the last moment were unable to get suitable

POLES AS SET.



gravel. Pole No. 1 was found to have a defect in the casting which is believed to be the cause of its early rupture. Pole No. 2 gave a very much better result.

The consensus of opinion seems to be that a 1—2—4 mixture is the best for use in this class of construction, and, while the experiments above were entirely satisfactory in the development of the problem, the hollow pattern is not considered to be the highest type desirable; that is, to combine sufficient strength with the least possible weight, in order to obtain ease in handling, and that the removal from place to place may be readily feasible.

To fulfill these requirements, the pole should be made with a superstructure of somewhat greater strength than the wires which it is required to support, joined to sufficiently added strength by reinforcement and added area in the base, especially at the ground line; and the base should be reinforced in the most effective way to withstand the extreme pressure at the point of fulcrum.

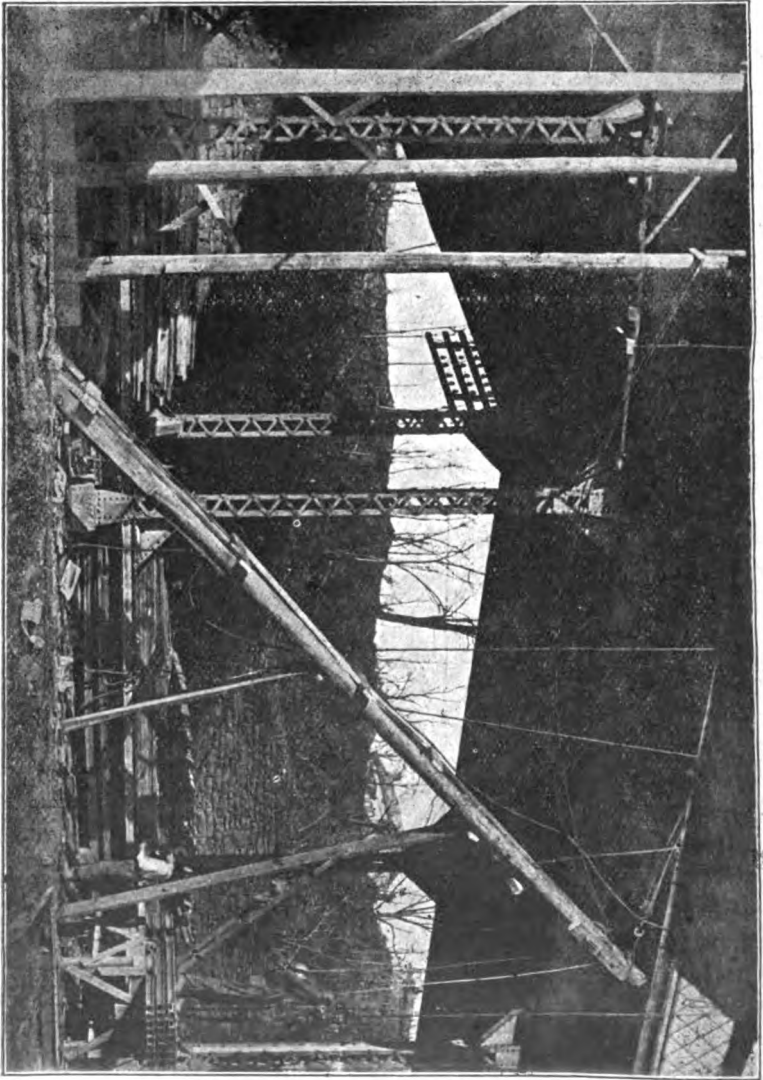
These conditions are all capable of mathematical computation, and if fulfilled, will give a product comparatively easy of manufacture, of reasonable cost, of greater tensile strength than the poles now in use, and extremely high durability.

I am sorry not to be able to go into details in the matter of cost. I do not feel that I can speak with authority as to this feature until their extensive manufacture be undertaken and completed, or at least until the completion of some further experiments contemplated in the near future.

POLE No. 1. CONCRETE, OCTAGONAL.

Length.	Base Diameter.	Top Diameter.	Depth in Concrete Anchorage.	Distance from Point of Fulcrum to Point of Load.
39 ft.	14 in.	8 in.	5 ft.	24 ft. 2 in.

APPLIANCES FOR TESTING.



TEST No. 1.

Deflection at Top.	Load, Pounds.	Deflection 12 inches above Ground Line.	Time.
3¾ in.	1,830	½ in.	3:17
5¾ in.	2,230	¾ in.	3:18

TEST No. 2.

½ in.	50	Temporary deflection, ½ in.	¾ in.	
8 in.	2,630		¾ in.	3:19
11¾ in.	3,030	Crack Nos. 1 and 2.	¾ in.	3:20

TEST No. 3.

1¼ in.	50	Temporary deflection.	¾ in.	
14¼ in.	3,430	Crack Nos. 3 and 4.	¾ in.	3:24
18 in.	3,210	Crack No. 5 and crushed bolt.	¾ in.	3:25
25½ in.	3,150	Pole broke at ground level.	¾ in.	3:26

POLE No. 2. CONCRETE, SQUARE.

Length.	Base Diameter.	Top Diameter.	Depth in Concrete Anchorage.	Distance from Point of Fulcrum to Point of Load.
30 ft.	13 in.	7 in.	5 ft.	24 ft. 2 in.

TEST No. 1.

Deflection at Top.	Load, Pounds.	Deflection 12 inches above Ground Line.	Time.
¾ in.	50		2:02
2½ in.	1,830		2:04
3½ in.	2,230		2:08

TEST No. 2.

¾ in.	50	Temporary deflection.	1 in.	
4¾ in.	2,630			2:10
8½ in.	3,030		¾ in.	2:11

TEST No. 3.

3½ in.	50			
31 in.	3,290			
34½ in.	3,430	Crack No. 1.	¾ in.	2:14

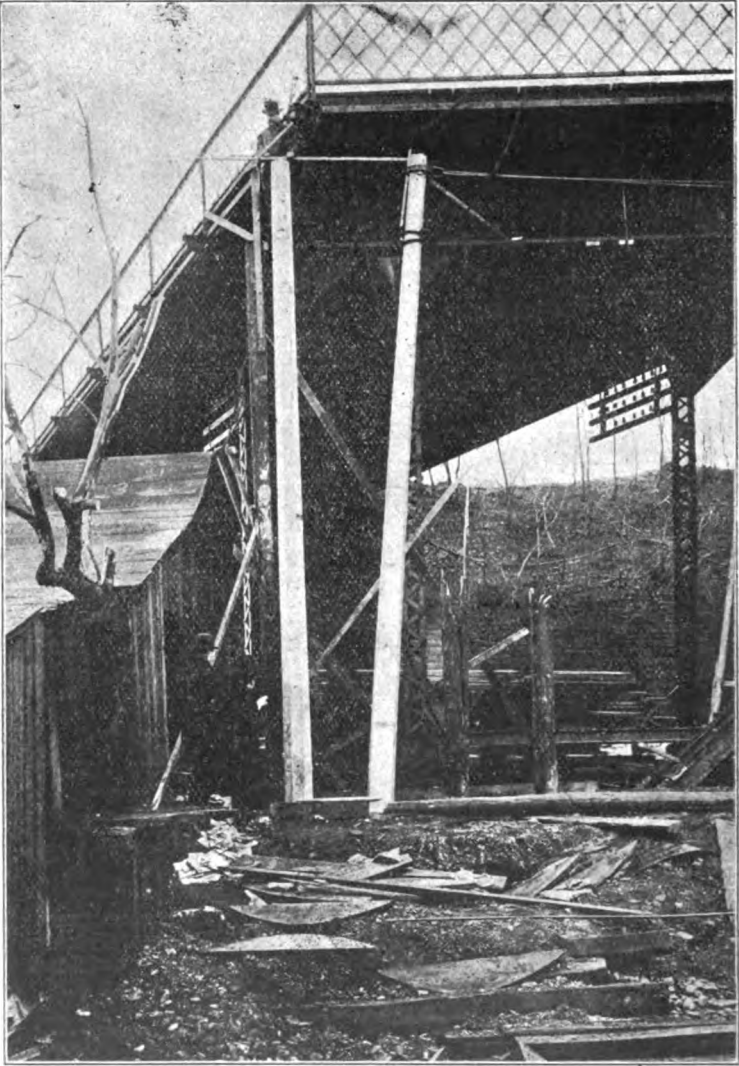
TEST No. 4.

21¼ in.	50	Temporary deflection.	22 in.	
39 in.	3,690	Crack Nos. 2, 3 and 4. Pole crushed, crack at ground level.		

POLE No. 3. WHITE CEDAR.

Length.	Base Diameter.	Top Diameter.	Depth in Concrete Anchorage.	Distance from Point of Fulcrum to Point of Load.
30 ft.	14 in.	8 in.	5 ft.	24 ft. 2 in.
Deflection at Top.	Load. Pounds.			Deflection 12 inches above Ground Line.
14 in.	172			
37 in.	2,230			
47 in.	2,530	Pole broke.		
				Time.
				11:03

SQUARE CONCRETE POLE.



Test No. 4.
Photo No. 4.

Deflection, 64 inches.

POLE No. 4. WHITE CEDAR.

Length.	Base Diameter.	Top Diameter.	Depth in Concrete Anchorage.	Distance from Point of Fulcrum to Point of Load.	
30 in.	14 in.	8 in.	5 ft.	24 ft. 2 in.	
Deflection at Top.	Load, Pounds.			Deflection 12 inches above Ground Line.	Time.
20 in.	1,830				11:50
22½ in.	2,230				11:51
29 in.	2,630				11:52
35 in.	2,870	First crack.			11:53
36½ in.	2,950				11:54
38½ in.	3,030				11:55
50 in.	3,370				11:56
56 in.	3,430				11:57
66 in.	3,494	Pole broke.			12:00

The argument has been advanced that the reinforced cement pole would be very liable to damage or disruption by shock, but the fact that concrete piles, both of hollow and solid designs, are driven by pile-drivers, and especially with the knowledge of the experiments at Rochester, which showed that the poles, even after they had been fractured at the surface of the foundations, required an extremely heavy pressure to produce further deflection from the positions at the time of the fractures—in other words, that they were almost as stiff as when they stood upright, and continued to be so throughout the entire test—I feel that any alarm at the prospect of damage by collision between the pole and anything less than a movable object that would destroy any pole of natural or manufactured composition is unfounded.

As to the insulating qualities of the concrete pole, it is hardly necessary to mention that they are superior to those demonstrated in any other pole manufactured in this country.

It is expected that within a few weeks some steel poles with just enough concrete to serve as a preservative, and

other steel poles covered experimentally with a cement paint, will be set in the line along the Fort Wayne Road. Experiments have also been made with several sizes of reinforced concrete cross-arms with very satisfactory results.

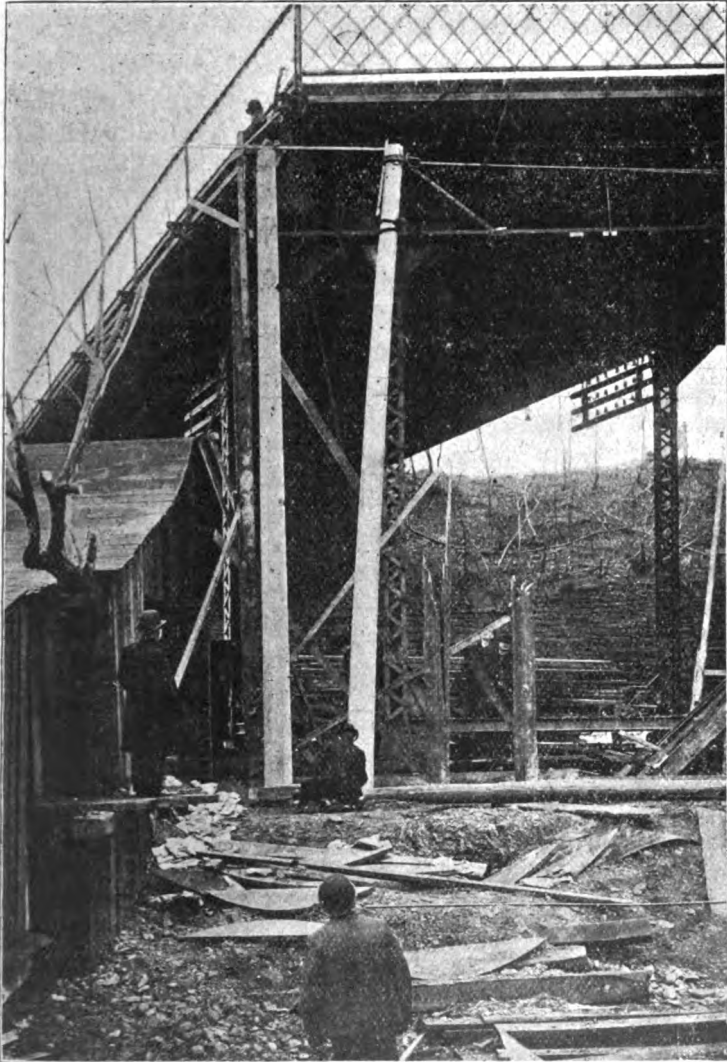
The tests at Rochester, Pa., were made by Mr. Robert A. Cummings, who built the poles for us in his yards at that point.

The paper was received with applause.

President Chenery: As outlined, Mr. Camp will start the discussion.

Mr. Camp: I will save some little time by simply reading the few remarks I have to make on Mr. Cellar's paper:

SQUARE CONCRETE POLE



Test No. 3.
Photo No. 2.
Just before crack No. 1.

(Pole cracked at deflection of
 $34\frac{1}{2}$ inches.)

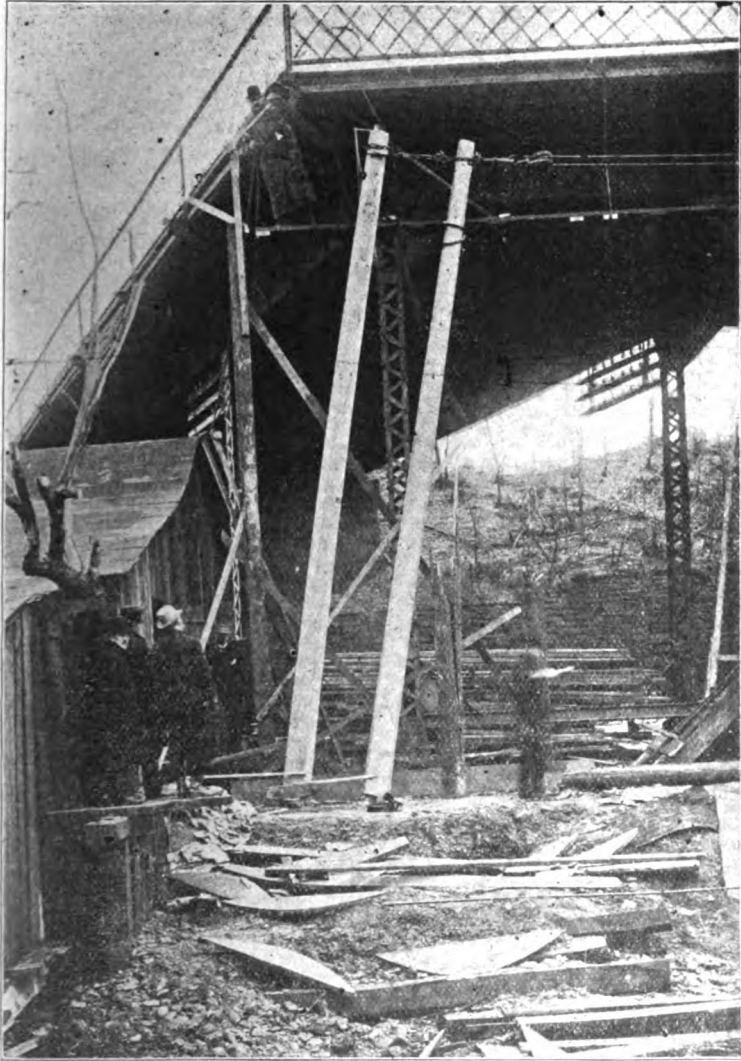
WOODEN POLE.



Test No. 2.
Photo No. 1.
Deflection, 56 inches.

(Pole broke at deflection of 66 inches.)

OCTAGONAL CONCRETE POLE.



Test No. 3.
Photo No. 4.
After pole broke.

(Pole broke at ground level at
deflection of $25\frac{1}{2}$ inches.)

DISCUSSION ON MR. CELLAR'S PAPER.

Mr. Camp: Mr. President, I have been requested to take part in the discussion on Mr. Cellar's very excellent paper and regret that this duty was not given to some one more capable.

Mr. Cellar has gone into the subject very thoroughly and left very little to criticise and I can only give a few disjointed remarks, as I only received a copy of the paper a few days ago, and have been exceedingly busy, the same as I presume are all the members of this association.

As far as Canada is concerned we have an ample supply of cedar within, generally speaking, reasonable distance of where required, for many years to come. Prices for poles are steadily advancing, however, principally on account of the reprehensible habit (from our point of view) that the natives of the United States have in persistently purchasing our best timber, no matter what the original cost, high freight rates and export duties amount to, and we have to take their culls or spend more money.

There is no cedar in Nova Scotia, but we are still able to obtain a good supply in New Brunswick. Throughout the province of Quebec cedar is found and comparatively short hauls are necessary. In Ontario along the frontier and west of Toronto the cedar is practically exhausted, but there is an abundance north of Toronto and Ottawa and west to Manitoba in various sections and the haul to destination on our lines fairly short. For Manitoba, Saskatchewan and Alberta we are obliged to get our poles either from the Lake of the Woods district for points east of Moose Jaw, which is 400 miles west of Winnipeg, or from British Columbia for points west of Moose Jaw. Our extreme haul

for the prairies is about 550 miles either east or west of Moose Jaw. British Columbia produces cedar along the greatest part of the Canadian Pacific lines including branches, but its lasting qualities are inferior to those of the eastern wood. The tapering is also so slight that our specifications call for one inch greater diameter than on eastern lines.

I do not think that on our system of nearly 11,000 miles of pole line there is a single pole of any other wood than cedar.

The prices f. o. b. cars we are paying this year may be of interest and are as follows:

at Top. Deflection	Pounds. Load,		Ground Line. 12 inches above Deflection						Time.
	25x6	30x6	25x7	30x7	35x7	40x7	45x7	50x7	
Division.									
Atlantic	\$1.00	.....	\$1.30	\$1.55	\$2.00	\$4.00	\$4.50	\$5.00	
Eastern			1.40	2.25	3.25	4.00	6.00	.....
Eastern Special				2.75	3.75	5.25	.....	9.00	
Ontario	1.10	\$1.50	1.35	1.75	2.50	3.50	4.50	6.50	
Lake Superior			1.50	2.50	3.00	.....	.....	.....
Central	1.50	2.00	1.85	2.50	2.10	2.40	.....	.....
Division.				25x8	30x8	35x8	40x8	45x8	
Western				\$1.00	\$1.20	\$1.70	\$2.40	\$3.00	
Pacific				1.00	1.20	1.60	2.00	.....

We have experimented, to a limited extent, with preservatives, but until the foregoing prices are largely increased it does not pay to spend much money for this purpose. Our experiment was to coat the pole for two feet, at the air and water line, with a composition of pitch-tar and grease applied hot with a brush. This soon sealed off and no apparent benefit was derived.

We then tried a liquid called Carbolite-Carbolineum, applied with a brush, but found that it did not penetrate beyond the surface of the wood. This probably due to the fact that the poles are generally full of moisture when

erected. In British Columbia holes were bored on two sides of the pole a few inches above the ground after the poles were up. These holes were 6 to 8 inches deep and made downward at an angle of 45 degrees. They were filled with the Carbolite Carbolineum and closed with short wooden plugs. We find that even in this case, the liquid does not permeate the wood and only preserves a very small circle around each hole. This is also probably due to the poles being full of moisture.

We have therefore abandoned such applications on all our construction this year.

The experience of the C. P. R. therefore confirms conclusions 1 and 2 given by Mr. Cellar against the use of preservatives, and in common with, probably, all other companies we find clause 3 well founded. The lines of the C. P. R. cover so much entirely new territory which in some sections unexpectedly develops an enormously increased telegraph business for the general public as well as for the proper handling of the railway traffic that it is practically impossible to know ten years ahead of what facilities will be actually required.

Although the companies in Canada are apparently certain of a supply of cedar for years to come, I think the time near at hand when manufactured poles will be necessary over some portions of this continent, and Mr. Cellar's paper will probably result in some progress being made. I think the poles should of such a nature that they can be shifted to a new location on account of the many changes along a railway double tracking single lines, putting in new sidings, erection of additional freight buildings, elevators, etc.

Some of the disadvantages of the concrete poles might be mentioned:

- (a) High cost for the complete pole.
- (b) High cost for hauling. If weight is 3,500 pounds per pole—only 15 to 20 poles per car can be transported instead of 70 to 80 cedar.
- (c) Cost of setting. As Mr. Cellar points out, a derrick car would be required. It would be necessary to have a very large derrick to reach to the line of telegraph, which in the case of the C. P. R. must be at least 30 feet from the rail wherever possible. On a busy line of railway very few poles could be set per day, thus greatly increasing the cost of construction.
- (d) Every pole would have to be stepped, adding still further to the cost.

As an offset the following are some the advantages:

- (a) Permanent poles which would not require renewing, except to increase their capacity.
- (b) Freedom from interruption to wires on account of burned poles—a most important gain.

The life of cedar poles I find varies greatly. We are this year rebuilding a line which was originally erected in 1877—30 years ago—and there are over 50% of the original poles still standing and good for a few years more if the number of wires were not increased. On the other hand we have had poles rotted clear through at the ground line at the end of eight years service. The first mentioned was in Quebec, and the latter British Columbia cedar used on the prairies.

Mr. Cellar: In listening to Mr. Camp's statements as to prices on poles I am reminded of the time, long, long years ago, when I was first in the telegraph service, that is the

kind of prices we got in this country. But it is the contrary now. I bought a few 35 ft. poles the other day and was charged twelve dollars apiece for them. As to concrete poles, I think we could come near equipping a 35 ft. concrete pole for twelve dollars, though I may be mistaken. The western cedar is more like the chestnut than like the northern cedar. has a higher resiliency, can be depended upon for strength in the early years of its life a good deal better than the northern cedar can. The northern cedar pole, while seasoning, cannot be dropped off a car without great danger of breaking. I understand you can throw the western cedar over a fence and not break it. The chestnut is a good deal of that nature. While the cedar poles of the north I have no doubt are very cheap, the fact remains there are a lot of us several hundred miles off the C. P. line and we have to buy the poles and pay the freight as well as custom charges.

Mr. Camp: We do not make our freight rate on poles going off our line any too low.

Secretary Drew: We bought some poles this year for some rebuilding work and I was much surprised to find even in our country where we have a good many cedar swamps where they are clearing them out now, to find the price of poles 25% more than they were last year. That simply shows those fellows have their eyes open and know poles are going to be scarce and they are going to have the money. Poles we bought last year for 90c, we this year paid \$1.25 for—6 inch, 25 foot pole, and not very closely inspected either. But for a 7 inch, good, straight, 25 foot pole we had to pay \$1.50. You used to get all you wanted for a dollar the same as Mr. Camp does now.

Mr. Selden: I have great faith in the future of concrete poles.

President Chenery: I have no doubt we could discuss this question indefinitely, but we have so many other papers, perhaps it would be better to pass on.

President Chenery: I will call on Mr. U. J. Fry. for his paper on "Dry Batteries."

Mr. Ryder read the following paper, by Mr. U. J. Fry:

DRY BATTERY.

By U. J. Fry.

Mr. President and Gentlemen of the Convention: As your committee requested me to submit something at this time for your consideration, will give you a line on dry battery as applied to block wire service. I regret very much that it has been impossible for me, on account of an excessive amount of work recently given us, to prepare and forward this paper in time to be printed and distributed with others. Inasmuch as I shall present nothing new, however, I feel that, perhaps, nothing will be lost, and trust there will be no serious inconvenience to you.

It is not the intention to take up the construction of the dry cell at this time, but I will simply give you our experience in using that class of battery in connection with our block wire service, together with a comparison of its cost with the gravity cell in such service.

In 1905 we placed 16 dry cells on the block wire at each Brookfield and Waukesha. On account of earth currents at Waukesha we used one of our other telegraph wires for a return, arranging the keys at both stations with front and back contacts, removing the circuit closers, and arranging

the circuit to close on the back stop without the battery and on the front with the battery, in a manner well known to you all. This circuit, including two 50 ohm sounders, measured 271 ohms. Each cell when placed in service measured 1.5 volts, and .125 ohms internal resistance.

At Brookfield we placed the battery on a shelf which had been used for gravity battery, and left in a somewhat unclean condition. At the expiration of 23 months each cell measured 1.31 volts, and 2 ohms internal resistance.

At Waukesha we placed the battery far back on a new and clean shelf in the telegraph table, with a closed door. After 23 months each of these cells measured 1.38 volts, and .68 ohms internal resistance.

We are inclined to attribute the difference in condition of these cells to the condition of the shelves on which they were placed, because the service performed by each has been about the same. We estimate each system of cells has been used approximately 120 times per day, 3,600 times per month, and, if continued, this would amount of 43,200 times per year. We also estimate the keys were closed 3,360 times per day making dots and dashes necessary to form letters and figures, which for one month, would amount to 100,800 times, 1,209,600 times per year, or 2,419,200 times in two years.

From the way this circuit works now we know it will continue to work two years, and, perhaps, longer.

Taking these two systems together we had, to begin with, 32 cells and 48 volts. At the end of 23 months we had 20.96 and 22.08 volts respectively, or 43.04 volts, a loss of approximately 5 volts.

These 32 cells cost \$5.12.

To secure the same voltage it would have required 48 cells gravity battery, at an initial cost of 42 cents per cell, or \$20.16, to which we add the expense for maintenance at \$1 per cell per year, making a total of \$68.16 for one year, and \$116.16 for two years.

For each additional two years the expense for maintenance would be \$5.12 and \$96.00 respectively for dry and gravity cells.

At present about two gravity cells per mile are used on block wires on many of the Western, and some of the Eastern Roads. Many of the block stations are closed during the night, and the arrangement of the dry cells to compensate for the extended sections at night will, we assume, take double the number of dry cells, or four per mile, to accomplish the same results.

Assuming the life of the dry cells, when properly installed and maintained, to be two years, we will estimate the maintenance only on a 100 mile block wire circuit for a period of 10 years, as follows:

100 miles, at 2 cells per mile gravity would require 200 cells. To secure the same voltage we would need 133 dry cells, but on account of the longer sections at night, 266 dry cells would be necessary.

For a term of 10 years each gravity cell would cost \$10, while the dry cell only 80 cents, or comparatively,

Gravity	\$2,000.00
Dry	212.80

I would not recommend cutting down the number of dry cells to the same voltage, but would recommend using double the number of dry cells you use of gravity and thus secure 50% more current to start with, and sufficient to

hold up the service near the end of each two years. I estimate the expense as follows:

200 Gravity cells, 10 years.....	\$2,000.00
2,000 Dry cells, 10 years.....	320.00
	<hr/>
A saving of.....	\$1,680.00

This would make a saving of \$1,680 per year, which, reduced to a mileage basis, would be \$1.68 per mile per annum.

In addition to this we do not need battery cupboard space in our stations, and are free from the accumulation of dirt, etc., accompanying gravity battery, and save the services of the lineman at each battery station four times per year, which is now an expense of about \$10 per battery station per year.

We are about to equip two block wire circuits, one 285 miles and the other 125 miles in length, with the dry battery system. A special key and a two lever three point switch have been designed to take the place of the old standard telegraph key and one lever two point switch, for the purpose of preserving in the block wire all the good features, with the addition of one feature which eliminates all objections to the present arrangement, in that, that the operator at one station is unable to extend the circuit between the stations on each side without cutting his entire set out. This will prevent the signals passing any office, and overcome the danger of operators making mistakes which are liable now when the circuit is cut through as above referred to.

In addition to using dry battery for our block wire system, I shall submit a proposition to the Telegraph Company before long for the use of dry cells on our short branch lines, where there are say not to exceed two or three offices.

and where but a small amount of business is transacted. We are also using the dry cell exclusively in connection with our private line telephone systems; and use it in connection with our synchronizing self-winding clocks, and in our office bell and buzzer service; in fact we use the dry cell wherever we can to the exclusion of all others.

Mr. Cellar: What dry cell?

President Chenery: The advertisement will appear in the proceedings.

(Blue prints were distributed in connection with the paper just read.)

President Chenery: Mr. Fry has undoubtedly given us some information on the use of dry batteries in the telegraph service that has not been presented before.

President Chenery: We have a paper on "Opportunities in the Telegraph Service," by Mr. G. W. Dailey, which we will be glad to hear.

Mr. Dailey: It is now nearly 4 o'clock. We have election of officers, and it would take about thirty minutes to read the paper and have discussion. Therefore, I suggest the paper be printed in the minutes and distributed that way. It is hard to remember them all and we have to refer to the printed matter.

President Chenery: Hearing no objections, the suggestion of Mr. Dailey will prevail.

Mr. Groce: I think we are rushing things too speedily. I think the Superintendents of Telegraph can make this association at least as strong as the Signal Association, which now has the ear of the American Railway Association. I, for one, would extend this meeting over another day and take more time to consider these papers.

Mr. Hope: Mr. Dailey is a genuine railroad man and I believe it desirable to have him read his paper.

The suggestion made by Mr. Groce, to extend the convention a third day, being put by the chair as a motion,

Having been seconded,

Was agreed to.

Mr. Dailey: I will request Mr. Davis to read the paper. I would rather listen to the paper than to read it.

Mr. Davis: Inasmuch as I was asked to lead the discussion I asked Mr. Dailey to let me see the paper. I will say positively it is a splendid paper, and Mr. Dailey can have all the honor and credit that go with the paper. I will, therefore, have to politely decline to read it.

Mr. Dailey read the following paper:

OPPORTUNITIES OF THE TELEGRAPH SERVICE.

By G. W. Dailey, Sup't Telegraph, C. & N. W. Ry.

Delivered Before the American Association of Railway
Telegraph Superintendents, Atlantic City, N. J..

June 20th, 1907.

Opportunity is the master of destiny; vigilance in watching opportunity, tact and daring in seizing upon opportunity, force and persistence in crowding opportunity to its utmost achievement, are the martial virtues which command success.

This subject assigned to me is so closely and completely merged with men and methods that this must necessarily be largely a discussion of men and their work in its relation to opportunity in our department.

For convenience of illustration we will consider a young man in the service in the positions of usual advancement.

viz., Telegrapher, Agent, Despatcher, Train Master or Assistant Superintendent, and finally as Superintendent. We will endeavor to show the cause and effect, the great bearing and relation that a proper conception and use of opportunities, as they present themselves, has upon the young man's life and business future.

If a young man grasps and makes the best use of the opportunities, which the wise and just employer should see are extended to him from time to time, there is little doubt but what opportunity means success.

First, the opportunity of the Telegrapher.

It is while serving as a telegrapher, his first field of endeavor, that a young man lays the foundation for his future success or failure. It is then that he is thrown among men of greater age and experience, men of varied and complex views and personalities. He naturally selects, unconsciously perhaps, some one or more of them, as examples of what he should be or what he should do. It is then that others have a great deal to do with moulding his character and general make up, and it is then that he needs correct advice and guidance. Do we, as officers, always see that he gets it? It is at this period in his career that he forms habits and methods of work, habits of thought and action that determine largely whether or not he will develop and advance or remain stationary.

This is the period, his first few years, when his personal make up and his opportunities are closely interwoven, and his entire future may depend upon the use he makes of them. For this reason we have seen fit, with your indulgence, to devote a considerable part of this subject to the Telegrapher and the Agent.

A young man entering service as a Telegrapher seldom has any previous business training. He is usually young and in the embryo and receptive stage. He probably would not recognize an opportunity if it stood in front of him.

The friends he makes and associations he forms leave lasting impressions on his mind. He believe all that he sees and mostly all that he hears. He does not usually investigate or discriminate before forming conclusions. He hasn't had to.

In his first year we will say that he may be thrown with an Agent or another Telegrapher who perhaps unfortunately lacked a good business training, or had no disposition to acquire one. No method or system of doing things. If a patron wanted a rate; hunt all over the office for the proper tariff, or wire General Freight or Passenger Agent for it. Papers, way bills, etc., piled indiscriminately over tables and desks, does his work safely enough, but has a hard way of doing it. Too much lost motion. A general atmosphere of indifference and dissatisfaction as is usual under such conditions. Naturally the young man is influenced by such conditions. He reasons that if the other fellow can get along and hold his job under such conditions, and with the minimum of personal effort, why can't he. He does not realize that perhaps more personal effort is involved due to lack of order and method. No one may have explained these things to him. No better way has been presented or illustrated to him. He fails to see his opportunity to step into the breach himself; to try and bring order, method and system and general betterment out of it. Perhaps he hesitates to exert his own views or influence on account of not wishing to hurt the feelings of his associates,

or fear of their displeasure. He doesn't know how some of the officials would look at it. He may think of acting, but does not act. Things go on in the same old way and so does he. He has missed an opportunity. Is he alone? No; Some one else, some officer, has also missed an opportunity there.

Another illustration; We who have been dispatchers have often heard the following dialogue over the wire:

Dispatcher: Where is No. 25?

Operator: Here.

Dispatcher: What are they doing?

Operator: Don't know.

Dispatcher: Have they got coal and water yet?

Operator: Guess not.

Dispatcher: When will they go?

Operator: Don't know. Will see, etc.

This operator is not posted. He does not know that what he ought to do was to have found out all about it and had it already for the dispatcher, and given him all the information at once before being asked for it.

He does not keep a small train sheet of his own, and jot down how each train is from hearing other stations report them, as we used to do in the old days. Does not keep Dispatcher advised when trains are coming. Does not even keep him advised of the delays of trains at his station until asked, then don't know much about it. Don't know what cars there are to go or where located in the yard so can inform conductor and save time; lacks energy, ambition and interest in his work; conductors and Train Dispatchers don't think much of him, they don't try to help him. He

gradually acquires a reputataion for laziness or indifference and is relegated to the rear. He has missed an opportunity; and as before, some one else, some officer, has missed one with him.

Now on the other hand we take the bright, active and hustling young telegrapher, and am glad to say this type is in the majority. He has everything clean and in order. His emergency signals burning brightly after dusk, even though he has had no necessity for using them for months. He knows what cars there are to go, where they stand and a switch list ready for the conductor. He knows where all trains are, and can inform a patron without asking the Dispatcher. He informs the Dispatcher when trains are coming, or when they are ready. If delayed, he knows why and informs the Dispatcher so fully that no questioning is necessary. Don't nee da derrick to get the information. He is uniformly industrious, obliging, ambitious, and does all he can to help the Agent, the Conductor, the Train Dispatcher, and the public, and endeavors to please them all. What is the consequence? He has them all boosting him, all singing his praises. It reaches the ears of the men who can help him and he gains promotion. He has made his opportunity.

His next position we will say is that of Agent. He realizes the importance and responsibilities of his position. He is the color sergeant of his company. He knows he is practically the General Manager and everything else at his station, and that the road he represents is gauged by his calibre, and is judged as he is judged.

It stands in the estimation of the community largely as he stands. He is representative of it. He keeps peace in

the family and in the vicinity. Keeps his officers posted as to everything of interest in his community. Knows he can do more good advertising for the company than any one else, and does it.

He does not complain that his salary is too small, but says he will make himself so valuable that they cannot get along without him, and that they will have to promote him, when he will receive more salary. He reasons that so long as he is a part of the organization, he wants to be a strong one and do everything to further its interests while he is a part.

He does not disparage the company he works for as that would disparage himself. If he can't get in line he will get out. He isn't carrying water on both shoulders. If a member of a labor organization, he is loyal to both, and to the advantage of both.

If he has any trouble or grievances he does not proclaim them from the house tops, but wisely keeps them in the railroad family, and doesn't trouble or edify the general public with them.

When his townsmen feel that they should be in fashion and do a little legislating against the Railroads, he knows that he can do more than any one else on the road to offset it, and does so. He tells his neighbors some of the good things his company does. Gets out and shows people where they are misinformed, and what the road has done for their town, even though they won't admit it. Explains many things that are not understood. Stands by his colors so well that even his opponents respect him for it. Tells his town people that his company is the best on earth, and says it so often, and stands by his guns so well that by and by they think so themselves. They also think he is the best

Agent on earth, and wouldn't have any other. After a while the company finds it out and he is promoted. He has made and improved an opportunity.

The next we hear of him he is a Train Dispatcher. One of the most exacting, important and responsible positions in the service, and unfortunately sometimes not appreciated as much as should be. Usually if a man makes good as a Dispatcher his future is assured, and he certainly has earned it. The qualities that brought him up from the ranks are still necessary for his success, with the addition of certain other qualities; principal of which is his ability to handle men in such a manner as to bring out their best effort and result. It is as a Dispatcher that a man first assumes authority and power of direction over others. It is then that the first real test of his official ability, and fitness for further advancement comes. Thereupon rests his opportunities.

Passing over the Train Dispatcher we will consider the Chief Dispatcher, and for the sake of brevity we will say that the same general principles concerning him apply likewise to the Train Master or Ass't. Superintendent. We all know the duties, the trials and tribulations of the Chief Train Dispatcher. We will here consider him only in his relation to the men under his direction, as I consider this matter of handling and directing employees one of the most important phases of his work and one bearing largely upon his opportunities. On most railroads the Chief Dispatcher usually handles the Telegraphers on his division. Right there lies his greatest opportunity and his greatest responsibility. The responsibility of molding the future business career of a great many young men.

We all know that the Chief Dispatcher is the busiest man on the railroad and can make or break a division. Most of the failures and misfortunes of the division are often laid at his door because some one else doesn't want to assume responsibility. He doesn't always receive his full share of credit for the good results that he is a party to. Some one else often takes the credit. He is entitled to our full sympathy and support.

With his many and varied duties of handling cars, motive power, trains, etc., he is charged with the duties of examining, appointing and handling the telegraphers. On small divisions this may be all right but it will not work out right on heavy divisions. This plan might have been all right twenty years ago, but it is not all right in the present day. Railroads have outgrown it. We need closer supervisions. On our road, am glad to say, we have covered this very satisfactorily.

Agents and Telegraphers are necessarily isolated and scattered over the divisions and it is more difficult to see them, watch them and get close to them, than it is to Train or Enginemen. The Chief Dispatcher must not overlook the importance of close supervision and education of these men. We should have systematic and well defined methods of molding, developing and looking after these young men whom we know we will have to use as Agents and commercial representatives later on. How many times a year does the average division officer, or any other officer, get off at a small one-man station and stay long enough to get well acquainted with the Agent or the night operator. The young man at the smaller places, especially the night man, doesn't have opportunities to talk frequently with his

officers. He absorbs his ideas from the men he works with every day, from the Telegrapher's Journal, and other trade journals. There is not much around him to inspire him with any feeling of *Esprit de Corps* or loyalty. The Chief Dispatcher who realizes the fact that the young telegrapher needs guidance and counsel, acquaintance and encouragement; the officer who will so arrange his affairs that he can see all his men at least once a month, become well acquainted with them, know each man's strong and weak points, enthruse them with a spirit of pride in their work, and a desire to excel and succeed, inspire in them through personal example, a feeling of confidence in the justice and integrity of their officers, has an opportunity that is well worth seizing.

We now come to the opportunities of the Superintendent. His field is bountifully strewn with the fragrant flowers of opportunity if he will but pluck them, and our own field, the Telegraph Department, is as fair a field as any. We will consider here but two of the most important:

First: Raising the standing of the department in the railway world to the place it rightly deserves by virtue of its importance and worth.

Second: Raising the standard of the personal to a higher plane, thus providing for the present and building for the future.

While we have no complaint on our road, or on some others that I know of, on this score, it occurs to me, from general observation, that a good man Railroads do not fully appreciate the value and importance of their Telegraph Departments. Why should this be? and why shouldn't it rank higher in the business organization of the roads, and

higher in importance in comparison with other departments. We take our hats off to the operating man who makes a record on train movement or tonnage, and to the traffic man who produces the goods. Why not to the telegraph man who produces first class telegraph service? Is not the Telegraph Department one of the greatest aids and utilities in producing these results? It is the eyes and ears, the nerves we may say, of the railroad organization.

We assume that one reason the Telegraph Department is not accorded higher rank and standing is due to the fact that it is generally regarded as a non revenue producing department. At least what it does produce cannot be reckoned in dollars and cents. We know it to be a fact that indirectly it does produce revenue by being the greatest and most important asset or facility of those that do produce revenue. If the Freight and Passenger Department, for instance, did not have good prompt, reliable telegraph service at their disposal, would it not have a heavy bearing upon the results and revenues of their departments. Would this not be true also of the Operating or any other department. By virtue of its use alone it cannot and should not be regarded as of minor importance.

It is fair to assume that another reason, and perhaps the prime reason, why the Telegraph Department is sometimes regarded as of minor importance and standing, is: that the Superintendent himself does not boost and push his own department as much as he should; does not enter into general affairs enough; does not enlarge his field of endeavor or the scope of his duties; does not get into the game often enough; does not seek or assume responsibilities. In our opinion such a course is inimical to the good of ourselves,

our departments and our companies. We as officers should seize every opportunity to fairly and honestly raise the dignity and standing of our department and one of the best ways to do so is to produce first class service.

We should seek opportunities to enlarge our field of endeavor and to enter into the general affairs of the railroad. We should fit ourselves for higher positions. We have an excellent opportunity for studying the entire railroad. Its methods, policy and physical conditions, and fitting ourselves for advancement.

When the departments of a railroad are lined up for inspection, or when on parade, there is no reason why our department should bring up the rear, with the cooks and ambulance corps. We ought to be well up in line where we can see the colors and hear the band. This, however, is a result that can be accomplished only through the personal effort and worth of the Superintendent, combined with proper support from his officers as well as the rank and file, and there lies an opportunity.

Now as to raising the standard of the personnel. In our judgment this is one of the greatest questions of the present time, because it is the effort of the personnel properly directed that produces all results. Loyal willing work is the basis of all good results. As officers, what are we doing to bring this out? Fifteen years ago when roads were smaller it seemed easier to maintain a close business acquaintance between officers and men, which was of great benefit to both. Now, when roads are larger, we have to adjust to meet the changed conditions.

Briefly touching upon this matter of raising the standard of the employee, I will refer particularly to the Telegraph-

ers. Some Telegraph Superintendents handle these men direct; some handle them in general; some don't have anything to do with them. As to that: I think the Superintendent Telegraph should have authority over telegraphers and railway telegraph service matter, as well as construction matters. He should stand above the Division Superintendent in authority in this respect.

Reflecting back to my earlier remarks on the Telegrapher and Agent, we, as officers, should undertake and find ways and means of educating and guiding these young men away from the bad and up to the good points I have previously mentioned. By very virtue of their situation they need more attention than do train or enginemen. They are isolated, as it were, by themselves. We should find ways and means of reaching them; of showing them the right way to do things; of encouraging and developing them to the highest standards of efficiency.

In this day of organization, show them they can easily be loyal to the company as well as to their organization. If they belong to one they don't have to obtain a divorce from the other. Show them that they can make their order a power for good and a means of educating and advancement in a personal sense, as well as a means of settling their troubles.

Encourage and advise subordinate officers especially, who should be high minded and sympathetic as well as strict and just disciplinarians, to get close to their men, to know them well, to treat them fairly, squarely and impartially, to bring out the good that's in them, and then do all these things yourself. It does no good to resolve that these are good things. The thing that counts is, do it. The man who counts is the man who does things. The man of action is

the man that accomplishes. Instill in our forces a realization of the importance of care and correctness, system and method in everything they undertake. We should meet with and acquaint ourselves personally with as many employees as possible and demonstrate that because one man is an officer and another an employee they do not necessarily have to stand at arms length. There should be no wide gulf of imaginary lines between officer and employee. We are all employees for that matter. A man sitting alone on top of a mountain is in a mighty exalted and dignified position but there may be others on level ground that it would pay him to be with. A perfect distribution of the personal equation is a valuable asset and a splendid plant to cultivate.

Human nature is the same the world over. If we can bring out and develop its best points in our employees, enthuse them with the old time spirit of pride in their work and the *Esprit de Corps* that all should have; inspire in them feelings of loyalty to themselves and the company; feelings of confidence in the justice and integrity of their officers, then the standard of the personnel from office boy to Superintendent will rise and continue to rise, and the results of our efforts will live on when we are gone, and will be a worthy legacy to our business posterity. In this alone can the highest grade of service be attained.

In conclusion we must ever remember that in conventions like this we may resolve and recommend, pass resolutions and regrets, write splendid papers or make the rafters ring with the reverberations of gifted oratory, but if we do not execute them, do not do things, we gain nothing. It is not the gifted writer or orator but the man who buckles on his armor, marches forth from this convention armed with a desire and a determination to accomplish some of the many

good things we have heard about here, that will succeed. In his desire to be of the utmost value to himself, his family, his company and his country he will find his field of endeavor overflowing with the beautiful flowers of opportunity.

The paper was received with applause.

President Chenery: There is no question but what it would have been a mistake if Mr. Dailey had not been permitted to read that paper.

Mr. Hope moved a vote of thanks be tendered Mr. Dailey for his paper and that it be printed in the minutes.

Which was seconded,

And agreed to.

President Chenery: Mr. J. L. Davis, of the C. & E. I., was billed to lead the discussion and we will be glad to hear from him.

Mr. Davis: I will say I looked over Mr. Dailey's paper very carefully. It certainly is of great importance for the Dispatcher to get out on the line and come in closer contact with the men. I know from my own practical experience just exactly what that does for the chief train dispatcher, and I know what it does for the Superintendent of telegraph. Two years ago the C. & E. I.—the Chief Dispatcher was loaded down with work until it was absolutely impossible for that man to get out on the road at any time without neglecting the work that demanded his personal attention in the office. Finally the Chief Dispatcher was allowed an Assistant Chief Dispatcher. It was not looked upon very favorably by all concerned, and it lasted only a short time. I was very much pleased, about thirty days after the Assistant Dispatcher had been taken off, to find the very men who opposed putting on the Assistant Chief Dispatcher

were the very men who came before the General Manager and said, in my presence, that they had made a very great mistake, when requested to reduce expenses, by taking off the man they found was really the most important man that they had, and that was the Assistant Chief Dispatcher. And his great importance to them came about by his relieving the Chief Dispatcher who could be free to go from office to office and supervise the work of the Operators, become acquainted with what they were doing and very frequently assist the Division Superintendent in the performance of his duties. Now, at the present time, our Chief Dispatchers are again free. We have Assistant Chief Dispatchers who look after detail work, and the Chief Dispatcher can go and come when he pleases. We are liable to find him on any train or at any station at any time. We are getting very good results since having adopted that method.

I do not know I can say anything more on Mr. Dailey's paper. You heard it, and I fully agree with him in all he has said. (Applause).

President Chenery: Mr. Sherman was to participate in this discussion, but he is not present.

Mr. Hope: The paper speaks for itself.

Mr. Dailey: It doesn't seem to me that we pay as close attention to the operators as we ought to, and one of the thoughts to my mind in that paper was, that it is up to us to get busy, if nobody else does, and get as close as we can to the operators and make them just as important as the train or engine men. They are. The man who secures the freight is as important as the man who hauls the freight. Developing the men in the station service will accomplish a good deal of good, not only for the men but for the com-

pany. I consider that a part of the officers' duties. I consider it an officer's duty to look after the welfare of the men working under him just as much as he can. Training the personnel of the telegraph department will do a great deal of good. That was the idea that run all through this paper of mine. We are talking continually about getting better engines and better tracks, and the officers of the road are talking of time and tonnage, but how often through the year does anybody talk about the telegraph?

Mr. Groce: The Superintendents of Telegraph, I imagine, have got some new ideas, and I feel it is much better to have had time given these subjects. A short time ago I was shown some reports sent in by two inspectors. These men seemed to spend their time visiting each office and examining the men as to the rules, their efficiency, etc., and it struck me as being a splendid idea. I advocated this and have succeeded in securing it and I think it is one of the best things I have seen for some time.

These ideas as they come up, if we bring them before the management, they are brought to a closer realization of things. I know the managers of our road read the proceedings of the Signal Association, for instance, and also the Telegraph Association. It cannot be helped but these papers here will strengthen their purpose to improve the personnel of the telegraph department, and they can only do that through the Superintendent of Telegraph. On the system I represent, a record of employees has not been kept. I am seriously thinking now of beginning a system whereby we can tell every day where we stand. We have blanks sent in monthly showing the different men who have been dismissed and showing cause, but before that information percolates to other divisions he has gone to work again.

Sometimes they get in and work for quite a while and it is rather unfair to bring the matter up and dismiss them for an old offense.

Mr. Selden: "You never miss the water 'till the well runs dry." It is curious with many years of experience, yet I am unable to fathom the reason for the slight regard that the railroad people, as a general thing, have for the Telegraph. If there is a question of putting in a side-track there is a lot of figuring done and sometimes months pass before the actual work is done, whereas they say to the telegraph department: "We are going to put in the block system and we want another wire sixty-five miles long and we want it right away." At the end of a week there is your wire. See the apparent ease and short time as compared with track construction, and you have good reason to wonder why the telegraph work is so lightly regarded. The telegraph department is recognized as more important every day. It used to be hard to get lines up, but it is not hard now. We now have camp cars and we run special at night, not only for the railroad wires but for others besides. It is very rare any wires remain down over night. We are gradually and surely forging to the front.

When a man makes an application to one of our division operators for a position we refer to our card record, which is complete, and if we have no record we simply reply "no record." As I stated the other day, the moment a man is employed a card is started, so, although he may be employed on the extreme end of the line in twenty-four hours we have that card. If necessary to suspend, the first duty is to make up the card, and we keep track of that man. And the same follows promotion, so we have very little difficulty.

It has always been gratifying to me to feel, although the telegraph department was hardly appreciated by the railroad, that the personnel of the Superintendents, as a general thing, has been of the best.

Mr. Taylor, A. B.: I agree with Mr. Selden. Conditions so far as recognition by the management of railroads of the telegraph department have improved. During my short experience as Superintendent of Telegraph I have seen marked improvement in that regard. I certainly have nothing to complain of so far as our management is concerned in regard to improvements that have been brought about. Still I could not help but think, as Mr. Selden and other gentlemen were speaking, there is a great deal yet to be desired. It is quite a common thing to get a telegram from the Division Superintendent like this: "A new station at such a point will be opened on Monday. Old station to be moved some 100 feet from present location. Please have wires cut in by tomorrow night. It will also be necessary to remove three poles." It doesn't matter where they are to go. You must remove those poles and this must be done at once so as not to delay the work. We have all had experience of that kind.

Mr. Hope: I want to inquire, outside of the election of officers what other business we have before us.

President Chenery: We have a paper by Mr. Parsons, who is present; also a paper on "Wire Testing" by Mr. Jones; on "Error Sheets" by Mr. Logan; "Railway Telegraph Service" by Mr. Brown; "Visible Supply of Poles" by Mr. Ashald." In addition to that we have committees to report, one, as I stated this morning being a very particular one, and that is on Legislation for Wire Crossings.

There is another committee to report, on Pole Construction, and undoubtedly both of these reports will be very interesting.

Mr. Davis: There is one matter that was taken up at the Chicago meeting—Mr. Ashald was appointed chairman of the committee and I was a member with him—and that is the matter of getting up a blank to be used by telegraph operators in transferring unfinished business. I have got the papers and a sample blank decided upon, and when the time comes it will only take five or six minutes to dispose of the matter. The General Manager of the C. & E. I. called on me to know what progress we were making with the matter and I told him there was nothing to be done until this meeting was held, and asked if I should go ahead and fix up blanks according to my own ideas or whether he would be willing to wait until after this meeting. He said: "I would prefer to have the opinion of your convention." I dislike to go back to Chicago and say nothing has been done. If we can arrange to give that little matter five or six minutes before we adjourn I will appreciate it.

President Chenery: I see no reason why we should not handle that committee's report after we dispose of the papers.

Secretary Drew: It is ten minutes to five. I think we ought to have election of officers and the selection of the next place of meeting now, and then put in the rest of the time on the papers. If it is not out of order and meets with the approval of the gentlemen present, I move that we change the order of business and now proceed to the election of officers and the selection of the next place of meeting.

Which was seconded,

And agreed to.

ELECTION OF OFFICERS AND SELECTION OF CON- VENTION CITY.

Secretary Drew: I suggest that we select the place of meeting first, as sometimes that has something to do with the selection of officers. In that connection I will say that we have invitations from different quarters asking us to meet in the various cities, the most pressing one being brought to us by Mr. Camp, to meet in Montreal.

Montreal, June 10th, 1907.

The President, Association Railway Telegraph Superintendents, Atlantic City, N. J.

Dear Sir:—We beg to extend to you a hearty invitation to visit our city upon the occasion of your next annual gathering.

Montreal is the commercial metropolis of the Dominion of Canada and a city with a history replete in incidents and records affording interest to every citizen of the North American continent.

In behalf of our Executive Committee I beg to transmit to you some further information as to Montreal and its surroundings embodied in a little booklet entitled "Montreal."

Canada is attracting attention at this time to a very wide extent indeed. This is due in the first place to her endowment by Providence with an astonishing wealth of natural resources and fruitful possibilities.

The energy of our people is not alone confined to the making known of our country to an interested outside world, and I can assure you that if the Members of your Association will honor our city by selecting Montreal for

the place of meeting for 1908 that you will find Canadian energy as prominent in its endeavor to welcome the stranger and visitor as it is to attend to the more serious duties of our Canadian citizenship. I have the honor to remain, Dear Mr. President,

Your respectfully,

HENRY MILES, President,

Dict. H. M.

Montreal Business Men's League.

Montreal, June 11th, 1907.

To the President, The Association of Railway Telegraph Superintendents.

Sir:—I have the honour on behalf of the Council of this Board to heartily second the invitation extended to your Association by the Montreal Business Men's League to hold its next annual convention in this city.

As the headquarters of two of the greatest railway systems of this Continent, Montreal should be of interest to an Association whose members are so closely connected with the railways, and the city also offers in a general way many attractions for visitors.

Assuring your Association of a hearty welcome whenever it may decide to come, I have the honour to be, Sir,

Your obedient servant,

GEO. HADRILL, Secretary.

Mr. Ryder moved that Montreal be selected as the next place of meeting.

Which was seconded.

And agreed to.

Mr. Camp: I want to thank the association for selecting Montreal as the next place of meeting. In this con-

nection I might say that we will probably be able to give you a little more entertainment than is possible at Atlantic City. Mr. Kent told me before leaving that I might state it is altogether likely, if Montreal was selected, that he would be able to arrange a side trip over the Canadian Pacific to the ancient city of Quebec, though I cannot promise that definitely. Mr. Ashald telephoned me he would do his part towards having a trip over the Grand Trunk and cooperate with me in securing a return trip by the Richalieu and Ontario Navigation boats down the Rapids. The Business Men's League will, also, assist in the entertainment.

President Chenery: The members who attended the Montreal convention remember it with pleasure. I think there is no question but what we will have a good time at Montreal. But if we work from 9 o'clock in the morning until 11:15 at night, I do not know where the entertainment comes in.

ELECTION OF OFFICERS.

Mr. Hope: For the office of President for the ensuing year, I nominate Mr. E. P. Griffith, of the Erie Railway.

Which was seconded.

Mr. Davis: Considering the work that has been done in the last year, considering the very large amount of extremely important work that lies before the members of this association within the next year, considering that the man who now holds the position of President has had probably more experience in work along the lines he is now pursuing than any other member of this association, considering that he is probably better known as a railroad man throughout the United States than any other member of this

association, and with due respect to all others, I nominate Mr. E. A. Chenery, of the Mo. Pacific, to succeed himself as President of this association, and I urgently request all members to cast their ballot.

President Chenery: I think it would be in order for me to say Mr. Davis is out of order. I appreciate fully his kind remarks and certainly am alive to the honor conferred upon any one occupying the position of President of this association. But it is contrary to precedent, and I think it would be well to not trample on any such corns as we might step on. I, therefore, respectfully request that my name be withdrawn.

Mr. Griffith: Last year we met at Denver and because we have met at Atlantic City on this occasion is no reason why we should follow an old rule. I believe we were inspired to select a man suitable to carry us through the difficulties which confronted us, not for one year but for two. I thank you, my friends, for placing me in nomination, but I decline the office in favor of Mr. Chenery.

Mr. Hope: The office of president has certainly been well filled during the last year and we are all proud of our president. We have honored him for one year and as there are others I decline to withdraw my motion.

Mr. Ryder: We all appreciate the success of the association during the term of our president. I move the secretary cast the ballot for Mr. E. P. Griffith for president for the ensuing year,

Which was seconded,

And agreed to.

The Secretary cast the ballot as directed and the Presi-

dent announced Mr. E. P. Griffith elected President for the ensuing year.

VICE-PRESIDENT.

Mr. Ryder: I would like to place in nomination for the position of Vice-President G. W. Dailey.

Mr. Dailey: I appreciate the honor. I would like to nominate Mr. Ryder.

Mr. W. J. Camp was nominated.

Mr. Camp: As this is a United States Association—

Secretary Drew: No, sir; it is North America.

The nomination of Mr. Camp being the only nomination seconded.

Mr. Groce moved the nominations close.

Which was seconded,

And agreed to.

Mr. Parsons moved the Secretary cast the ballot for Mr. W. J. Camp for Vice-President,

Which was seconded,

And agreed to.

The Secretary cast the ballot as directed and the President announced Mr. W. J. Camp elected Vice-President for the ensuing year.

Mr. Camp: I think you gave me enough honor in selecting Montreal as the next place of meeting.

SECRETARY.

President Chenery: The next office is one for which there will undoubtedly be a good deal of contest.

Mr. Hope moved the President cast the ballot for the Secretary and Treasurer,

Which was seconded,

And agreed to.

President Chenery: As there is no name suggested, I presume it is left to the discretion of the President. I, therefore, take great pleasure in casting the ballot for Mr. P. W. Drew, as Secretary and Treasurer.

Secretary Drew: I didn't read all of Mr. Greene's telegram. I thought it was not proper to read it at that time, but he put in a sentence which says: "In case of any doubt of your re-election you have my proxy." I was sure of one vote.

President-elect Griffith was escorted to the chair amid applause.

President Griffith: I am sorry you made this mistake. It is too bad. ("Brace up. Forget it.") I can't until after we adjourn. However, I thank you. I cannot see any reason for making this mistake, even considering how serious it is, except it is that your stay in Atlantic City and New Jersey has been so pleasant—and busy—that you wanted to elect a man from Jersey to show your appreciation. I believe that is the only reason.

President Griffith: Inasmuch as we are to stay over until tomorrow, I believe that motion is already carried, I think a motion to adjourn is in order.

Mr. Chenery: While that motion did prevail, it was suggested that, perhaps, an evening session—

Mr. Groce: I wish to speak against any more night sessions.

Mr. Ryder: I want to know what is this rush to get away from Atlantic City. Having experienced difficulties in getting papers in the past, it seems to me very queer that when we find a committee that has been able to get something as this committee has done, for us to rush through the meeting, helter skelter, and act as though we were disinclined to give a proper amount of time to consideration of the papers is not at all courteous. I don't think it is fair to the men who have prepared these papers. The Signal Association has been referred to several times as being on a better basis than that occupied by this association. I wonder if the members secure a time-card as soon as they get in a town to see when the next train leaves. What is the matter with us, anyway? I wonder if Mr. Dailey didn't hand us personally a rap last night.

Mr. Rhoads: Possibly the largest difference between us and the Signal Association is that they pattern largely after the American Association and work through committees. Their committees formulate a good deal of their work and consequently they get through a little quicker than we do.

Mr. Cellar moved the convention adjourn until 9:30 o'clock tomorrow. Friday morning,

Which was seconded,

And agreed to.

THIRD DAY—MORNING SESSION.

(Friday, June 21, 1907.)

The convention was called to order by President Griffith at 10 o'clock A. M.

President Griffith: The next paper on our list is one by Mr. L. M. Jones, on "Wire Testing." Mr. Jones is not present. I believe Mr. Ryder will favor us.

Mr. Chenery: Before starting on that paper, lest we forget, I would like to make a motion that sub-committees of this association be appointed to represent the East and the West, and the South if you choose, these committees to consist of three members and to hold quarterly meetings at some point to be designated by them, the object of these meetings being to discuss matters of interest to the association generally, and for the purpose of securing papers, we will say, for the next annual convention. My object is to arrange for meetings after those we have recently had in the west. Therefore, I make a motion that the president appoint three committees to meet and discuss subjects that may be suggested to them.

Which was seconded.

President Griffith: I think that is a very wise thing. You have seen the great benefits to be derived by the western meetings. If the meetings are held quarterly we can arrange our affairs so as to be there. As I understand it to be in the power of the chairman to call a special meeting if thought necessary. Do you incorporate that in your motion?

Mr. Chenery: I had in mind the appointment of committees to take in the East and West and they to make such arrangements for meetings as would appeal to them. For instance, in Chicago the meetings were brought about by some local condition, and it was really no attempt at organization at first, but I think it was at the second meeting that a chairman was appointed and he took it upon himself to

notify everybody when the next meeting would be held and what would be discussed, and my motion was intended to appoint committees to arrange for such meetings and such discussions as suggested themselves, the details to be left entirely with these committees.

Secretary Drew: There are few members of the association in the South. There would be six you could get down there. Perhaps it would be a good thing to give these fellows a chance to get together. Some of them don't know very much of what we have in this association except when it comes to paying dues.

Mr. Walstrum: I think it should be allowable for the members to attend both meetings. There might be men in the East and South or West and South. It seems to me two committees are all we want.

Mr. Parsons: These committees would not hold their meetings at the same place at the same time, and I think the chairman should be instructed to send a synopsis of the minutes of each meeting to the other committees.

Mr. Chenery: I will modify my motion and make it two committees.

Secretary Drew: I think there is some misapprehension in the minds of some as to what this means. It does not mean that these three men are to get together and hold their meeting, but it is intended that these men shall be responsible for calling a meeting and getting all the members in their territory to the meeting. It seems as though three would be ample to do that. They are not the officers of the meetings, but when the members get together they will elect a chairman and secretary of their own body.

The motion to appoint two committees, of three members each, having been duly seconded,

Was agreed to.

President Griffith appointed the following as said committees:

EASTERN COMMITTEE.

C. Selden, B. & O., Baltimore, Md.

L. B. Foley, D. L. & W., N. Y.,

A. B. Taylor, N. Y. C. & H. R., New York.

WESTERN COMMITTEE.

E. A. Chenery, M. Pac., St. Louis, Mo.

J. L. Davis, C. & E. I., Chicago, Ill.

C. S. Rhoads, C. C. C. & St. L., Indianapolis, Ind.

President Griffith: You understand it is the duty of the chairman to make the call and name the place of meeting.

Mr. Davis: I suggest Indianapolis be considered the most eastern city within western territory and that Cincinnati, for instance, be the western point for eastern territory.

Secretary Drew: I think we had better divide it according to the Central and Eastern time. That would be very easy for us all to remember.

Mr. Chenery: I think this will work itself out. The committee will notify those whom they might think in their sections. Since I have been honored by being appointed chairman I will make every effort to get all the people of the West and a good many people of the East to attend our meetings.

Mr. Ryder read the following paper, entitled "Wire Testing," by L. M. Jones.

In the successful operation of a telegraph system carrying, as most systems do, a volume of business almost equal to the capacity of the facilities under favorable conditions, it is of the utmost importance that all the wires available be kept in use as nearly all of the time as possible.

To do this, some one must be made responsible for all delays in locating and removing trouble, which can best be done by the division of the territory into wire testing districts.

The proper location of the wire testing offices is very important, as there are usually many things to be taken into consideration. Almost invariably there exists on every wire testing district a necessity for repeaters or quadruplex apparatus, and in order to have these located under the direct supervision of the Wire Chiefs, the office is located where the repeaters and multiplex apparatus are required.

In order to secure the best results, the hours of duty should not be such as to overtax the physical ability of the Wire Chief. The twenty-four hours may be divided into three tricks of eight hours each, corresponding with those worked by train dispatchers. The first trick, 8 A. M. to 4 P. M., can be taken care of by the Manager of the office, with the dual title of Wire Chief and Manager; the second trick, 4 P. M. to midnight, and the third trick from midnight to 8 A. M.

The Wire Chief and his assistants, to be successful, must, in addition to having had experience in wire testing, be fully posted in the handling of multiplex apparatus.

One thing very essential to the successful Wire Chief is patience. Few operators at way offices understand thoroughly their switchboards and circuits even when regular. consequently when asked to make a patch, they lack confidence in their own ability, and should the Wire Chief lose patience, the result will probably be a wrong connection, and the loss of much valuable time.

Each wire testing office should be supplied with, in addition to a spring jack switchboard and spare sets at the board for testing purposes, a milammeter and voltmeter of suitable scale ranges.

In the location and clearing of trouble, the methods in use are much the same everywhere; however, will enumerate separately those which are usually followed, and from which satisfactory results are obtained.

FOR A GROUND.

The margin or pull of the relay magnet will give you a good idea as to whether the wire is grounded near you; then proceed by having offices open the wire until the ground is located between two offices.

FOR AN OPEN CIRCUIT.

If the circuit is a comparatively long one, and paralleled by other working circuits, place your voltmeter in the circuit for a moment. If near you, the needle will remain almost stationary; if very unsteady, the open is probably some distance from you. Or, place the open wire on a battery of preferably more than one hundred cells, then cut in a test and let the relay spring down low, opening and closing your key. If the break is comparatively close, a very short dot will follow the opening and closing of the

key; if further away, the dot will become perceptibly plainer, increasing with the distance from the test office to the open. A large number of relays in the circuit, however, will detract from the sensitiveness of this latter test. This will save time in tracing for the location. Have different offices ground the wire until located in an office, or between two offices. If the wire is broken between offices, one end will usually touch the ground and remain grounded, while the other will remain open. This, if known, will give you a good idea as to the location outside of an office. However, the usual office tests should be made.

FOR A CROSS.

When two or more wires are crossed, have the distant terminal open all wires affected except the most important wire. Then locate by having different offices open one or more of the wires which are out. When located between offices, have the usual office tests made to be sure it is outside.

FOR AN ESCAPE.

An escape may be either an escape to a ground, or to another wire. An escape to a ground is located in the same manner as a ground.

An escape to a cross is located the same as a cross. If only slight, it may only be felt with a voltmeter, and resemble closely poor insulation.

In testing for trouble in an office, first have the wire cut out at the bottom of the board, removing the instrument plugs. This will clear the wire if trouble is not in the board. If this does not clear it, have the wires removed from the top of the board, and the ends twisted together.

This will clear if in an office. The same test at the other of the two offices between which the trouble was located will definitely locate it outside of an office.

To clear a switchboard of a burned lightning arrester, remove the grounded wire temporarily until the plate can be removed and filed or scraped, and insulated with mica. If an office has hinge or gate cutouts instead of a switchboard, the wire should first be cut out, then if the trouble does not disappear, the removal of the ground wire from the cutout will have the same effect as taking the wires out of the top of the switchboard. A plug cutout or one-wire board should be handled in the same manner as a switchboard.

Wire Chiefs often complain of failure of operators to follow instructions, especially when requested to remove wires from the top of switchboards, especially when requested to remove wires from the top of switchboards and cutouts. This is sometimes due to the fact that linemen have used pliers to tighten nuts, and the operator not having a pair, is unable to take the wires out, and rather than tell the Wire Chief he cannot do so, makes a bluff by waiting a sufficient length of time and probably saying, "Now," leading the Wire Chief to believe the wires have been removed.

In order that a lineman may not be given a wrong location, for example, the day chief locates trouble on his district, which, the lineman being at some distant point, and train service such as to make it impossible to reach the trouble before dark, instead of notifying him at once, transfers the trouble to the second trick chief; he re-tests and transfers to the third trick chief, who re-tests and notifies the lineman. In this way, no time is lost in clearing the

trouble, and the lineman is not disturbed in case the wire comes clear in the meantime. If an interruption is reported to a lineman by the first or second trick chief, and he fails to clear the trouble before dark, he reports this to the Wire Chief on duty. The wire should then be re-tested and the lineman advised if still in, or of any new developments.

All wires should be tested by the third trick chief before daylight. Linemen understand if no trouble is reported to them, none exists, leaving them free to carry out any projected work on hand.

The train wire is of first importance, and must be made good, if needs be at the expense of everything else. The through quadruplex wires are of next importance. After locating and patching trouble out of a circuit, it should not be again disturbed until it is known that the trouble has been removed. When the trouble is reported clear, or lineman asks for a test, the through circuit should be left intact, and the section where the trouble existed tested by using a local circuit and getting both patch offices in; then if found clear, the lineman should first be advised.

If a quad wire, the offices having the quad sets should be notified in order that a new balance can be taken, if necessary. The taking out of fifty or seventy-five miles of iron wire from a copper circuit often working on a very narrow margin may so affect the balance as to make the wire almost unworkable.

In order that there may be no delay in clearing wire trouble, it is necessary for the Wire Chief to at all times know the exact location of his Division Line Repairer. Early each morning, say 7 A. M., each Line Repairer should file a work report giving movements for the day, stating

explicitly just where he will be, and on what trains he will move, if away from headquarters, advising the Wire Chief immediately of any change in his plans.

In case of unusual conditions prevailing, Wire Chiefs should be authorized to direct the movement of construction or repair gangs, as communication with the Superintendent's office may be entirely cut off by wire trouble at any time.

In case of a sleet storm, or any unusual interruption affecting all wires, so as to cut off communication with the general office, each Wire Chief should immediately advise his Superintendent fully of the conditions on his own district, and continue to do so at intervals until communication is again restored, using Western Union or Postal wires, if working. If all commercial wires are down, the telephone toll lines should be used, if available.

GENERAL REMARKS.

I have noticed a tendency on the part of some Wire Chiefs to discourage operators calling for a balance, which often results in operators working for some time on a wire almost unworkable, which could be remedied by a balance, and its capacity often doubled.

The third trick chief should, in addition to testing all wires early in the morning, carefully inspect his repeaters and quadruplex apparatus, especially the points of his pole changers and transmitters, and balance his quadruplex sets, for the reason that during the early hours of the morning, possibly only one or two corners have been in service, and the wires are too busy to be taken out of service for this purpose after the arrival of the first trick chief. While the use of files for cleaning points is very necessary at times, it should be borne in mind that a clean smooth point is by

far more desirable than a clean rough one, or one with sharp edges or corners.

Once a week, all wires should be measured for insulation, and current strength of different circuits measured. Quad batteries should also be measured, compensating resistances of quadruplex sets adjusted, and a full report mailed to the Superintendent of Telegraph. For insulation tests, a battery of approximately one hundred cells should be used, all wires to be removed from this battery while being used for this purpose. The wires should be removed for the reason that otherwise the current strength will vary, being governed by the demands upon the battery, due to the opening and closing of the other wires.

In making insulation tests we use a battery of one hundred cells if available, or a current of 90 volts potential, inserting a voltmeter in the different circuits, having the distance terminal open the wire, noting and recording its deflections. If the needle shows an escape, intermediate offices are called in until the point of escape is located as nearly as possible. The lineman is then advised and instructed to report when covered. Upon receiving his report, the wire is again tested and the lineman advised of the result.

The current readings are taken by inserting a milameter in the different circuits while conditions are as nearly normal as possible. In this way, we secure a report showing the actual amount of current being furnished for the operation of each wire.

Mr. Camp: About thirty years ago when I first began testing wires I found when I told an operator to open a wire for a minute it was liable to be left open for half an

hour. I began to think in what manner I could get over this difficulty, and came to the conclusion that instead of asking the office to open the wire I would tell them to try me on that wire. If I heard the dispatcher working with any office on the line I could test with that office. Or if a way-office was reporting a train I could take the test while he was reporting. Then you didn't have to wait a half hour.

In regard to taking wires out of the top of the switchboard, which has been referred to. If the wires are in cables and the cables are properly constructed you will never make a mistake putting the wires back in the proper binding posts.

Mr. Walstrum: I am opposed to the practice of taking wires from the top of the switchboard. The frequent changing of these wires breaks them. I think uniformity in placing wires in the switchboard is very important, as the testing man knows exactly where the wire is.

Secretary Drew: We have all had some laughable experiences in the matter of testing. Mr. Camp's experience reminded me of a case where we had an order to an operator to ground No. 1, north. Well, it was probably a minute and a half before we heard anything from him. Finally he grounded it. The wire chief says: "What made you so long?" He says: "I didn't have any instruments cut in and I had to cut them in before I could ground them."

We also had a very laughable, and serious, case one time that came in a little ways out of Chicago. The trouble would come in about ten o'clock every night. It would disappear about five o'clock in the morning. We hunted and hunted for that cross and asked the operator at this station if he had any trouble on his switchboard. He said: "No, sir."

Finally, we slipped a man out there one night, after the thing had been going on four or five nights, and found the Irishman who had charge of the freight house had one of those old-fashioned long keys to lock the door, and when he got through at night and had locked the freight house, so as to have his key in a conspicuous place he hung it on the switchboard.

Mr. Van Akin: We had a case of trouble one time and it took two days to locate it. We put in a brand new switchboard in the office. A man went there and found there was no place for the wires to get crossed. I told him it was there. I sent another man out who came back with the same report. I went out myself, and wetting my fingers located the trouble due to varnish. There was no way to clear that except by taking the wires out of the posts.

Secretary Drew: I had an operator who was a very neat young man and disgusted with the appearance of his instrument table. He went down town and bought two yards of nice oil cloth. He took a whole Sunday to do the work. When we cut in Monday morning there was trouble. We asked the fellow what he had done. Everything was in fine shape in his office; he would like to have us come and see it. I sent a man to see it. He saw it very soon.

Mr. Chenery: I feel like apologizing at this time for my action as your former chairman. Perhaps I made a mistake in not listening to all the reports of the committees. We have two or three interesting reports, which should receive attention at this time, worthy of discussion. I move that before discussing the present paper further or listening to other papers that we hear from the committees.

Which was seconded,

And agreed to.

REPORT OF COMMITTEE ON WIRE CROSSING LEGISLATION.

Mr. Groce, Chairman, presented the following report:

Your committee on Legislation for Wire Crossings began to gather information relating to the laws in effect in the different states upon this subject soon after the meeting held at Denver in 1906. The correspondence upon this subject brought a suggestion from some of the Superintendents of Telegraph that a special meeting be held at Chicago of such Superintendents of Telegraph and others interested as could attend. A meeting was arranged and at that meeting the subject was discussed. At a subsequent meeting in Chicago it was decided that an amended copy of Michigan law No. 171, would probably stand the best chance of enactment. A title suggestion taken from the law of Wyoming was added, thus making the act one for the protection of trainmen: (See copy in circular in fore part of these minutes.)

As the Illinois Legislature was about to meet it was thought advisable to make an effort to secure the enactment of this legislation at that session. It was introduced as Senate bill No. 84. After its introduction it was referred to the Committee on Railroads and it has not since been heard from. The Legislature has now adjourned until next fall. The subject of Wire Crossing Regulations was also brought before the Legislature of Iowa during the session just adjourned and a law was passed empowering the Railroad Commission to prescribe standards of Construction and maintenance. The Commissioners have requested the Superintendents of Telegraph of lines in Iowa to attend a meeting to be held by the Commissioners during the month

of July for the purpose of formulating such standards. It is recommended that those Superintendents interested post themselves as to the date of the meeting and attend prepared to offer suggestions.

Copies of the proposed bill was placed in the hands of representatives of the different Orders of Railroad Train Men and we were given the support of those organizations in our efforts to secure this legislation.

After the bill was introduced in the Illinois Legislature, our attention was called to the fact that there would possibly be some annoyance caused to the railroad companies if they should be compelled to apply to the Railroad Commission or some other State authority for permission to cross their own tracks. While it is possible that it would be of some advantage to have the bill changed, your Committee, however, thinks that whatever should be done in this nature the requirements should still cover a standard of construction, that is, work done by any company should conform to the standard required of other companies desiring to cross the tracks and telegraph lines of, or along, any railroad. To advocate the enactment of a law which would permit a company to cross its own tracks or telegraph lines with a line of inferior or dangerous construction would place us in an inconsistent position. It may, however, be well to have the regulations stipulate that a road may construct a crossing over its own road or telegraph lines at any time by conforming to a specified standard. A discussion of this feature by the members of the Convention is recommended.

Your Committee is not now able to report on the legislation in effect in all States and Canada. Early in our cor-

respondence we were advised that the Canadian Railway Commission had certain rules and specifications, but that they were to some extent insufficient for proper protection, and officials of the Canadian Pacific Railway Company's Telegraph were making an effort to have the existing rules amended. The result of those efforts is not known to the committee. Our information covers the following States:

MICHIGAN:—The law places the specifications for the construction of telegraph, telephone or electric wires of any kind, over steam railroads, under the control of the Department of the Commissioner of Railroads and it is our information that the provisions are adequate and satisfactory to the railroad companies.

ILLINOIS:—The owners of lines or cable over steam or electric railroads must maintain their lines not less than 25 feet above the surface of the rails. There are no other specifications.

Telegraph, telephone and electric light or other wires of any kind constructed over tracks of any steam road, shall be constructed in accordance with specifications given in the Act. The specifications are fairly adequate and seem to give the protection desired.

IOWA:—Previously mentioned.

MINNESOTA:—The law gives to telegraph and telephone companies the general right to string wires but nothing definite is specified for a standard of construction over crossings. Some more definite and specific standard is desired.

NEBRASKA:—The law gives telegraph and telephone companies rights for crossings and prescribes the standard height. It also prescribes for an agreement by contract as

to the manner and kind of any such crossing. It provides for a means of arbitration in case of disagreement and in general would seem to meet requirements.

KANSAS:—Has a law placing the regulation and stringing of telegraph, telephone and electric light or other wires under the supervision of the State Board of Railroad Commissioners and that board has issued rules and regulations governing the construction and maintenance which are very fair and meet the requirements.

COLORADO:—Lately passed an act giving general rights for the construction of telegraph, telephone and electric light or power wires which are to be so maintained as not to obstruct or hinder the usual travel on such highways. Wires carrying an electric current of 5000 voltage, or higher, to be constructed under an agreement between the parties interested. The law provides for arbitration in case of a failure to agree. Adequate provision for a standard in the construction of power lines carrying less than 5000 volts or an ordinary telegraph and telephone line is not mentioned and something of this kind is desirable.

SOUTH DAKOTA:—The law grants rights for the construction of telegraph and telephone lines, but provides no standard and something further would seem to be desirable.

WISCONSIN:—Has a statute granting privileges to telephone and telegraph companies but no provisions are made for standard of construction or maintenance. Some such law would seem to be desirable.

KENTUCKY:—Statutes give rights for constructing and maintaining crossings but do not provide a standard for such construction or maintenance. A law of this kind would be desirable.

TENNESSEE:—Statutes give rights for construction and maintenance specifying that any line must not obstruct or damage highways, railroads, etc., but gives no standard of construction or maintenance. Something of this kind is desirable.

MISSISSIPPI:—Telegraph and telephone companies have rights to construct such crossings, the construction to be such as will not interfere with the running of trains or use of operation of telegraph lines. Some more definite standard of construction and maintenance is desirable.

LOUISIANA:—Telegraph and telephone companies have the right to construct and maintain such crossings provided that the ordinary use of the railroads and telegraph lines thereon be not thereby obstructed. No standard of construction requirements is given, which is desirable.

As the enactment of any legislation on this subject will necessarily have to be carried on in each state separately, it is the recommendation of your Committee that the Superintendents of Telegraph interested in each state move jointly in bringing before each State Legislature where the laws do not now offer ample protection, an act such as the one which was introduced in the Illinois State Senate as Bill No. 84, or some such modification of this act as may seem desirable to the members of this association. It is also believed that the members of the different train men's organizations can be of great service in securing the enactment of such a bill and it is recommended that they be called upon by the Superintendents of Telegraph or some other proper official of the Railroad. One of the railroad systems with which a member of your Committee is connected had 10,000 copies of a circular printed quoting the bill which would be pre-

sented to the State Legislature, setting forth its aim, and requesting in the same circular, over the signature of the General Manager, the co-operation of those interested. We believe that this is a good plan and further action of a similar kind by Companies interested is recommended.

All cities have laws governing the wiring of buildings for electric service of the various kinds and many of them have regulations for pole line construction where heavy currents are used. The rules of the National Board of Underwriters have become a force equal to law of the land. The object of the legislation which we hereby advocate is of equal importance and there is no doubt but that every legislature in the land would meet the requirements if the question were as well known generally as are the objects of the National Board of Underwriters Rules. The opposition found to any legislation favored by Railroad Companies or Telegraph Companies in certain States would surely not exist in the case of this Wire Crossing Legislation if the facts were known. It possibly seems to the layman that no person would deliberately construct and maintain a dangerous crossing, and this may be true, but many people do not fully appreciate what is dangerous, nor do they appreciate the extent to which a Railroad Company or Telegraph Company is hampered in the performance of its duties to the public by the interference caused by interruption in telegraph and telephone service.

A company, or some individual, desiring to build a line at small cost is given the right by law to construct over and across a railroad at a public crossing. In hundreds of cases no attention is paid to the line after construction until it falls down, and in many cases of cheap building the fall

comes soon after the construction. It may be said that the Railroad or Telegraph Company which is crossed and which suffers from the break may have recourse by bringing an action for damages, but this, at best, is locking the stable after the horse is stolen, and in addition, in many cases, nothing could be recovered if suit should be won. Crossings made at places which are not public highways are of course different and can be controlled. In general, we believe all companies have this latter class of crossings in hand and allow them only under contract.

Since experience has shown us that we cannot enforce proper construction and maintenance under present conditions, in many states, we therefore recommend that this Association endorse the actions towards securing just and equitable laws and that the individual members work to that end.

Mr. Groce: Just before I left Chicago I was reliably informed that our bill in Illinois had been opposed by the Western Union Telegraph Company. I did not have time to take it up with them but I have understood that they look with disfavor on any legislation of this kind simply for the reason it might retard them in some immediate construction work. I think, however, they realize as well as any other company the importance of something of this kind. Your committee in considering this subject did not dwell largely upon the high potential line crossings. The interests represented in the different legislatures seems jealous of anything at all of this kind brought up, and it was our opinion that a simple law that would place in the hands of the constructing company power to enforce some good and safe construction would be better than to have any extended construction standards.

Since arriving at the meeting, Mr. Fry has placed in my hands a paper to which is attached the printed act sent out by the secretary of this association, which is identical with the act I have just read.

The Ill. Central started last fall and made a record covering about six hundred miles. I haven't got the figures at hand, but it was somewhere near seven hundred and fifty crossings, 60% of which were of fairly safe construction and 40% absolutely dangerous. About four months ago we had a case where a power company carried a line of four thousand volts over our telegraph line, and one afternoon it was thrown on to our wires and the current carried eight miles, burning up a depot and \$12,000 worth of freight, and went the other way and damaged our big terminal switchboard at the New Orleans office.

We have had on our line two cases where linemen were seriously injured where the crossings were quite a distance off. The men working on telegraph lines with no crossings in sight are very apt to forget these things. One was killed and the other seriously injured, and the city electrician was seriously injured in one of the cases. This would appear to me to be a good basis of argument in placing our legislation before the different states. The annoyance caused by these interruptions we all know are great. We have on an average one case of trouble every day of the year by telephone wires coming down across our wires.

The report does not cover the entire United States for the Committee did not have time to take it up and carry it out. We figured this report would show, in a measure, the conditions and the way we are compelled to handle them. Then, the members in the states in which legislation is de-

sired, are better posted and have a better way of getting the facts.

Sometimes legislation is passed as has been passed this year that we know nothing about.

Mr. Ryder: Certainly no more important subject can come before this association. I move the report of the committee be accepted, spread upon our minutes and the committee continued, my idea being it will be the duty of the committee to endeavor to interest or keep up the interest of the various Superintendents and try to get permanent legislation in the states. During the past winter the anti-railroad feeling existing through the country hampered our efforts very seriously, and in a great many states practically no effort was made because we realized anything that the railroads might want would be the very thing they would not get. Now that feeling is changed somewhat and I believe we can secure this legislation in the future if we keep at it. We won't get it unless we do.

So far as the telegraph companies were concerned there was some feeling on their part against legislation. But I am inclined to think it is more local than general, and hinges partly on the idea that they would be hampered in making quick movements sometimes. But I don't believe there would be any trouble of that kind. That is, when they have to seek permission from a railroad commission or others, the railroad company will be in a position to help out a matter of that kind.

Mr. Chenery: I think all things considered the committee has done remarkably well. No tangible steps were taken to secure legislation until since the last meeting, in Denver. At one of the meetings in Chicago this matter was

brought out and a circular embodying our recommendations sent out. Therefore, I think we have started something and ought to keep it up. I shall be very glad to second Mr. Ryder's motion, that the thanks of the association be tendered the committee and the committee be continued. Before a general discussion is had on this matter I think it would be well for the convention to listen to Mr. Fry.

The motion was agreed to.

Mr. Fry: It was necessary for me to appear before the legislature of Minnesota. Not having been previously advised as to the necessity of my appearance there it was rather sudden and made it necessary for me to look for some ammunition. I could not think of anything better than to try to discover why it was that after having gone over our entire system and taking measurements we found wires which were at the legal height of twenty-two feet which in six months after were eighteen or nineteen feet above the rail. I made a stand on the matter in Minnesota, and not being well informed as to what would occur I said I thought in the event of a pole leaning 6 inches that would give a drop of 3 or 4 feet in the center of the span. I haven't worked it out. When I went to Wisconsin I found there eight or ten telephone companies objecting to the bill. After having gone into the matter further, by making actual tests, I secured some very bad figures. After getting the figures from the engineer I presented them to my friends and they agreed with me that something was necessary. Feeling I could do more with them by falling in line, the telephone company having brought me a law, after looking it over I thought it was as good as any we could get.

(With the aid of a diagram Mr. Fry showed his method

of obtaining figures, and presented the following as the final result) :

Test dip and theoretical dip at center of a 100 foot span of wire by the insertion of slack as indicated, the original dip when the wire is taut being 2 inches below the level.

Slack.	Test Dip.	Theoretical Dip.
2 in.	1 ft. 11 in.	2 ft. $1\frac{1}{2}$ in.
4 in.	3 ft.	3 ft. $\frac{3}{4}$ in.
6 in.	3 ft. $9\frac{1}{2}$ in.	4 ft. $4\frac{1}{2}$ in.
12 in.	5 ft. $7\frac{1}{4}$ in.	6 ft. $1\frac{1}{4}$ in.

This means if you have a pole on both sides of the track, improperly guyed, one pole leaning 6 inches you get 4 feet from the center of the span. If 150 feet span the fall in the center of the span for a 12 inch slack would be 7 feet 6 inches. If a 200 feet span the fall would be 8 feet 6 inches for 12 inch slack. I have a little formula if you wish to determine just what the proper drop would be.

Mr. Chenery: I think the argument of Mr. Fry shows conclusively the necessity for legislation, and I recommend these figures be printed in the minutes—the secretary has anticipated me—with the discussion.

Secretary Drew: In a great many instances motions are made that matters be printed in the minutes. It is unnecessary for everything will appear in the minutes.

Mr. Fry: In presenting these figures I want to say there are few men who appreciate the danger of one inch of slack or the leaning of an inch of a pole improperly guyed.

Mr. Van Akin moved a vote of thanks be tendered Mr. Fry on his talk,

Which was seconded,

And agreed to.

Mr. Dailey: There is one thing we must not forget. The majority of the state legislatures have adjourned and will not meet again for two years. I assume we cannot do anything before two years.

Secretary Drew: There is one little point I have thought of that, I think, we could use to good advantage. That is, if we will interest our trainmen. Some roads have been careful to do that. The legislators seem to think more of the trainmen than they do of the rest of us and they will do more for the employees than for the officials. These men are directly interested, because we know every once in a while one of them gets pulled off a freight train and is maimed or killed. The engineers themselves run into these wires sometimes with their engines and it causes them a good deal of trouble. If we can interest our employes in the operating department you will find these fellows can drop a word or two that will be heeded and heeded a good deal more than something we may say. They are afraid of these fellows because they all have a good command of votes good many more than we do, and they will do it for them when they will not for us.

Mr. Ryder: There is another piece of ammunition that would have a good deal of weight with legislators, and that is to have a few pictures of some of the wire crossings that we all have. Of course, it would be perfectly proper to pick out the worst ones. But I think we all have in mind crossings the pictures of which would speak for themselves.

Mr. Davis: I move that the minutes of the executive session be printed and distributed to the members within thirty days and that the minutes of the open session, also, be printed and distributed within thirty days, and that the

Secretary be empowered to employ a sufficient amount of additional help to enable him to do this, and that the members be assessed a sufficient amount pro rata to cover the expense.

Which was seconded.

Secretary Drew: I would like to talk on that motion. In the first place the minutes of the executive session we hope will be distributed to each member inside of fifteen days. The stenographer and myself have got together on that project.

As to the minutes of the regular session being printed inside of thirty days, there are some features that prevent us from doing that. In the first place, we depend, as you know, largely upon the advertisements to cover the expense of these minutes. Our advertising friends all want more or less time to prepare their matter. I write them just as soon as I get home, and sometimes it takes three or four weeks before they prepare their matter and get it to us ready for the book.

Another thing. To get up this book is no small job, and it is something that one man has got to do. You cannot put somebody else on and let him help you. You have got to do it yourself if you want to get it up right. The first thing we do is to get the galley proofs of the minutes. These are cut up and sent out to each member for revision. There are few men who say exactly what they mean in an impromptu speech. When they come to see it in cold print they want to make some little correction, alteration or addition. We give those who take the principal part in these discussions an opportunity to do that. That is of very great advantage in giving us correct minutes.

Now, that takes time. Some of the men to whom I send these with the request to please hurry them up don't return them for three weeks. What are you going to do? You cannot go ahead and print and say we will let him stand for what we have got. That won't do. So that accounts for an apparent delay in the minutes. It would seem as though it were an easy matter to get these minutes out in thirty days, and if any of you want to try it I will be very glad to turn the job over to you and let you see what difficulties you run up against. The minutes are gotten out just as soon as these various hindrances—many of which the secretary is not responsible for, I assure you—can be overcome. The minutes are not in my office twenty-four hours before they are mailed to every member of the association.

So I hope that no such motion will be passed here today, because it is impossible to get these distributed in so short a time.

Mr. Rhoads: It seems to me it would be proper to say unless the proofs are returned in two weeks the minutes will be printed.

Secretary Drew: The galley proof proposition works very well, with this single exception: it does take time. With the long experience I have had I think we have just about got as near the thing as we can. There have spoken in this meeting at least thirty men. At least twenty of these men have got to have copies. Some have only said a few words, and, of course, I can go over that and straighten it up myself, but where one has talked quite a little while he wants to have his proof himself. He should have it and I want him to have it.

Mr. Chenery: With the assurance of the Secretary that

the executive meeting minutes will be distributed in fifteen days and every effort made to get out the full proceedings as early as possible, I suggest that we leave the matter in the hands of the Secretary. In this connection, however, I would like to say this. I believe up to the present time the dues have been ample to take care of all printing, but, perhaps, we would broaden out a little bit. It occurs to me that the Signal Association, which has been set as a model for us, sends out a great deal of matter, and I therefore move that a separate copy of the report of the committee on wire crossing legislation and the discussion following be printed and distributed to the members, and, as has been stated, if the Secretary hasn't enough money to take care of this extra printing the association members be assessed pro rata.

Mr. Groce: I suggest that Mr. Davis change his motion. I believe it would be a good idea for us to have this report and the discussion printed in a separate paper, that several copies of the paper be sent to each member of the legislature in the states where we are desirous of a law upon this subject, and the association be assessed pro rata for the expense of having these printed. I want to ask that Mr. Davis make his motion read something in that line.

Mr. Davis: I will be very glad to withdraw my motion.

Mr. Taitavall: I want to add a word or two in defense of the Secretary. I think each man should receive a copy of what he has said. I receive letters saying: "Do you intend to print my article?" Sometimes I get fifteen or twenty corrections on one paper. That shows the necessity of going carefully over anything that is to be printed. I think the Secretary has adopted the right course.

Mr. Walstrum: In regard to this legislative matter, I do not think the association should furnish the extra copies. The railroads can have printed the extra copies and send them to the legislators. I think it should be handled in that way.

Mr. Dailey: I believe this matter has been submitted to all the legal departments of all the roads.

Mr. Walstrum: We don't want to print extra copies of all that has been said. If the railroad companies want to use them they should be willing to have extra copies printed.

Mr. Chenery: I think the gentleman is under a wrong impression when he speaks about enough copies to send to the various legislators. That is not the object at all. What we want is a few copies for our own use as a means of securing the co-operation of the legal department in securing this legislation.

Secretary Drew: Separate from the other which would be in the minutes. I think that would be an excellent plan, and I believe it can be done with but little extra expense. It would be easy to extract that, make an extra heading and put it in separate. I will do that without any further suggestion, and send at least six copies to each one with their minutes, which will, also, have it inside. That is a fine suggestion and I think we can do it readily.

President Griffith: The Secretary has promised to cover that. Is the motion before the house withdrawn?

Motion withdrawn.

President Griffith: It is getting late and we will proceed to the next committee's report. We have one on pole construction. Mr. Maver, the chairman, is not here. Mr. Ryder, I think you have the paper. Will you kindly favor us?

Mr. Ryder: There were no meetings held, as I understand it. Mr. Bristol did not do anything so far as work on the committee is concerned. Mr. Maver and Mr. Fowle had considerable correspondence upon the subject, the result of which was that Mr. Fowle got out a list of questions that the committee wishes submitted to the members of the Association, and from the answers a report can be worked up later. The questions are numerous and go into the proposition in great detail. I believe if these questions are submitted to the members and carefully answered the result will be worth the trouble. It all hinges, however, on the question of these answers being accurate. That means work for all of us and I think we ought to do it. I don't believe we should take up the time of this meeting to even read these letters. Let them go in the minutes with the questions. But I do want to make a plea for the presentation of these questions to the members and that they be given proper consideration.

REPORT OF COMMITTEE ON POLE LINE CONSTRUCTION.

Association of Railway Telegraph Superintendents.

Committee on Pole Line Construction.

Wm. Maver, Jr., Chairman.

136 Liberty St.,

Chicago, Ill., March 20th, 1907.

Mr. Wm. Maver, Jr., Chairman,

Committee on Pole Line Construction,

Association of Ry. Tel. Superintendents,

New York City.

My Dear Mr. Maver: Your letter of March 15th, 1907,

has been received and noted. I gave some thought to this subject over a year ago and my experience of the past year has not changed my first idea, which I will try to give you briefly.

The telephone and telegraph companies can, of course, furnish much valuable information as to the construction and maintenance of pole lines, but the railway proposition seems to me to be an entirely different one from an economic or financial standpoint. The telephone and telegraph companies construct, operate and maintain pole lines for direct revenue therefrom, while the railway companies construct, operate and maintain, or lease and operate, pole lines and wires for the movement of traffic and for revenue only indirectly. That is, with the railways, communication is a source of expense and not of revenue directly. Therefore, the value of communication to the railways is represented by two factors, first the actual cost of providing it, and second, the losses occasioned by its interruption, such as overtime for train crews caused by delays to traffic and the losses in delays to traffic, reduced mileage per day of motive power and rolling stock, etc. That is, a conservative view of the matter seems to be that the railways can afford to invest in a pole and wire plant an amount which will provide the necessary communication and which will also construct a plant of such stability that the interruptions will be so few and infrequent as to occasion financial losses so small as to be much less than the total annual charges on the investment, at least.

Theoretically the proposition might be put in this way: Add to the total annual charges on the pole and wire plant the financial losses to the operating department caused by

interruptions of communication and call this the total cost of communication. It is then obvious that as the investment in the pole and wire plant was increased, the interruptions due to weak construction would diminish. It would be expected, then, that an increase in the total annual charges (arising from better and more stable construction) would be accomplished by a decrease in the losses due to interruptions and a point of maximum economy and minimum total annual cost would be found, under any given set of conditions, which would determine the best character of construction which could be afforded.

This is doubtless a point of view which is somewhat academic, but it seems to me to furnish the best guide as to the procedure which should be followed. The Telegraph Superintendents are now in possession of information as to the standards of construction adopted by the telephone and telegraph companies, and I do not see very much to be gained by discussion of the matter, except to bring out the frequency and duration of wire troubles and pole failures in the various seasons of the year. The fact that so many of the railway companies are securing their telegraph facilities from the Western Union Telegraph Company, may create difficulty in going into the financial side of the question as it actually exists on such roads.

However, it has seemed to me that the committee could best get at the situation which confronts the Superintendents of Telegraph by sending out a circular letter in blank form, setting forth questions to which answers are desired, the information to be for the use of the committee in preparing its report. Such a letter could be drafted in a way calculated to bring out the facts as to present facilities and

the cost of maintenance. I would divide the subject into Construction and Maintenance, going into details and costs under each heading; I would also endeavor to draw forth opinions as to the loss of revenue or increase of expense to the Operating Department, caused by interruptions such as ordinary wire trouble and complete line failures.

It seems to me that the committee would perform a valuable service in the gathering of these statistics and presenting them to the association with such discussion of the subject from a theoretical standpoint as might seem proper.

Kindly let me know whether my views are acceptable and what I can do further to assist and assume my share of the work of the committee.

Yours very truly,

F. F. FOWLE.

Manager.

New York, April 5, 1907.

Mr. F. F. Fowle,

Am. Tel. and Teleph. Co., Chicago, Ill.

My Dear Mr. Fowle: I have read your remarks with much interest and while at first sight they might in parts, as you suggest, be considered as somewhat of an academic nature, yet when analyzed it will be seen that they properly arise from the proposition to improve the pole construction so that it will withstand severe storms, and of course as well the ravages of the elements generally. It is because loss of revenue follows loss of communication, and because expense for reconstruction follows collapse of lines due to weak construction, that improved methods of pole line construction along railways were suggested—hence the appointment of our committee.

If, as I think you intimate, the telephone and telegraph companies have now reached excellence in pole line construction, and it is only necessary for the railways, in order to reach the same state, to adopt the methods of those companies, there is perhaps not much left for our committee, as originally appointed, to do. It was my view, however, that owing to the fact that the railways control their own rights of way, and, as a rule, require for their own use comparatively few wires on their pole lines, methods to obtain more stable construction, might in their case be available, than is always possible in the case of telegraph and telephone companies. From this point of view I think it is a little unfortunate that there is not at least one railroad telegraph man on the committee, so that this feature of the case might be threshed out. In the instances where the W. U. Tel. Co. supply the wire facilities to the railroad companies, I suppose the pole construction is according to the best practice of that company.

I may say further that my idea has been that the loss of revenue due to, and the expense incurred by the frequent collapse of railway pole lines, occasioned by severe storms, are so evident that no discussion was required to demonstrate the facts. But the actual losses and expenses due to proposed plan, however, these losses and expenses would perhaps be brought home to the railway managers, and the wisdom of increased outlay to obviate or largely reduce these losses and expenses, would, it is assumed, be clearly indicated. I think your proposition is an excellent one, if it can be carried out. I have some misgivings that it will not be a very easy thing to obtain the data you have in mind. If, however, the plan should be followed, it appears to me

it will involve a division of the committee's work into two parts. Firstly, an investigation as to the losses and expenses, as aforesaid, and (assuming that this investigation showed a necessity for improved pole line construction), secondly, the best method of pole line construction to effect the desired results, confining the proposition to railway lines exclusively.

I fear the preliminary investigation would consume more time than we have at our command, inasmuch as the Chairman of the Committee on Papers has informed me that all papers should be in the hands of the Secretary before the 15th of May. Perhaps, therefore, it might be as well to hold the matter in abeyance until the meeting, when the question of having a railway man or two on the committee, together with the new phase of the subject which your letter introduces, could be submitted, to the meeting, for consideration, and for further instructions. Kindly let me hear from you on these points.

I would add that if it should seem to you that there may be time for any report this year, I should be very glad to get a draft of such a letter to the Superintendent as you have in mind.

Very truly yours,

(Signed) WM. MAVER, Jr.

Chicago, Ill., June 10. 1907.

Mr. Wm. Maver, Jr., Chairman,

Committee on Pole Line Construction,

Association of Ry. Tel. Superintendents,

New York City.

My Dear Mr. Maver: Your letter of April 5 was duly received, but reply was delayed on account of the lack of time to prepare the list of questions which I had in mind.

This list I have now completed and embodied in the form of a circular letter, which is enclosed. The list is a long one, containing 92 questions, and it will require some time to obtain the replies. As the work of the Committee in digesting the replies will require considerable time and labor, I would suggest that the circular letter, if it meets with your approval, be submitted to the convention in June for the approval of the association, before we go further.

In framing these questions, I have tried to bring out the important points pertaining to line construction and maintenance as now practiced. Very probably some of the questions cannot be answered by many superintendents on account of the lack of data, but one purpose will still be served, namely, that the necessity of keeping maintenance records can be helpfully pointed out in our report.

I agree with you that the needs of the railroads from a telegraph and telephone line standpoint are different from the needs of the telegraph and telephone companies. The starting point seems to me to be the deficiencies of present practice; at the same time that we get these deficiencies, in reply to your circular letter, we shall no doubt learn much about types of construction which are giving every satisfaction. The work of our committee will naturally be of a confidential nature until the association publishes our report, if it so elects; I mention this in order that the point may be brought out in the convention, if you think it best, that all replies in the nature of personal opinions will be treated personally and grouped according to the views expressed.

I regret that I shall be unable to attend the convention.

However, I shall be glad to take up the work again if the association desires the committee to continue the subject.

With kind regards, I am, Yours very truly,

F. F. FOWLE.

New York City, June 1, 1907.

Supt. of Telegraph: Please answer the following questions regarding telephone and telegraph lines on your road, as fully as possible and give the information asked for, for the use of your Committee on Pole Line Construction. Return this circular, with your replies, to the Chairman before December 1, 1907.

Yours truly,

Yours truly,

Chairman.

(1) Date.....

(2) (Name)Company.

(3) Furnish a geographical map of your system showing the location of the general offices, division offices and all stations; also the number of operating tracks on each portion of the road, the division limits and the territory included in each division and the principal mileages, giving the main line and branch line mileages on each division.

(4) In what States does your road operate?

(5) What is the character and the contour of the country traversed in each State? Is it mountainous, hilly or flat? Is it wooded or open? What portions are swamp lands?

(6) What is the character of the soil in each State? (Please go into this thoroughly, as it is important.)

(7) What is the climate in the several States traversed?

(8) In what months of the year do you experience sleet

storms in each State? How severe are these storms and what diameter of sleet commonly accumulates on your wires? Are such storms accompanied by high winds?

(9) In what months of the year do you experience snow storms in each State? Are they accompanied by high winds? Do you experience wet snow which clings to poles, cross-arms and wires?

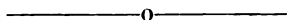
(10) Are your pole lines exposed to unusual conditions which increase the liability of line failures? If so, please reply in detail, giving the conditions fully.

(11) Furnish a geographical map, in size the same as that prepared in compliance with question No. 3, showing all wires used by your company over its entire system in telephone and telegraph service, giving the following details.

- (a) The territory included in each operating division.
- (b) Copper wires and the gauge of each. (Give name and number of gauge.)
- (c) Iron wires and the gauge of each. (Give name and number of gauge.)
- (d) Steel wires and the gauge of each. (Give name and number of gauge.)
- (e) Wires other than copper, iron and steel. (Give name and number of gauge.)
- (f) The offices connected to each wire for testing purposes.
- (g) The offices connected to each wire for operating purposes.
- (h) Give the principal mileages on each division.—

main line and branch line mileages and the mileages between important stations.

- (i) State the kind of service given over each wire.
- (j) Show all aerial cables, giving the character and mileage of the same.
- (k) Show all underground cables, giving the character and mileage of the same.
- (l) Show where your wires leave railroad property, if they do so.



Your committee desires to avoid the appearance of attempting to investigate the subject of the mutual relations between the railroads and the telegraph or telephone companies as regards leased lines or reciprocal contracts. The foregoing questions relate only to wires used in railroad service, regardless of ownership and it is desired by your Committee that every road represented in the Association send in the data asked for above. In order to go further into the question, all roads have been divided into three classes, as follows.

Class A. Roads owning all poles and wires and leasing none.

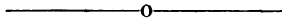
Class B. Roads owning part of their poles, or part of their wires, or both and leasing the remainder.

Class C. Roads owning no poles and no wires, leasing all their wires.

Class A roads will be expected to answer the remaining questions fully; Class B roads only so far as their own poles and wires are concerned; and Class C roads will not be expected to answer at all. So far as Class B and C roads

volunteer information in regard to leased poles and wires, the information will be considered by your Committee in its relation to pole line construction and maintenance.

Class A and Class B roads which own wires other than those used in the railroad telephone and telegraph service, such as signal wires or leased telegraph wires, will please include these wires in replying to this circular. Such wires should be shown on the map asked for in question No. 11.



(12) Is your road in class A, B or C?

(13) Class B roads will please indicate on the map asked for in question No. 11 the respective portions of their poles and wires owned and leased.

Construction.

(14) Give the number of poles to the mile now set in your lines. If this varies give the number per mile in each uniform section, naming the sections.

(15) Give the kind and dimensions of poles now set in your lines; total length, depth set in the ground, diameter at top, diameter at ground and kind of timber. If this varies, give the details for each uniform section, naming the sections. If special fixtures of any kind are in use, please describe them stating under what conditions they are used and where.

(16) Are any of your poles creosoted, painted or treated with preserving compounds? If so, state how many and where, giving kind of treatment.

(17) Give the dates on which your several sections of pole line were set. If they have been rebuilt since first constructed give dates when this was done.

(18) Were your poles obtained under specification and were they inspected before acceptance? If so, please furnish copies of specifications.

(19) Under what conditions as to curves and corners are your poles guyed or braced?

(20) How often and in what manner are your poles guyed or braced in straight sections of line?

(21) Are your poles raked on curves and corners? If so, how much?

(22) What kind of guys and braces are employed? Give tensile strength of guy strands employed.

(23) In what manner are guys and braces attached to poles?

(24) In what manner are guys and braces anchored or set in the ground?

(25) Give the dimensions of cross-arms now attached to your poles and the number of pins per cross-arm, with the distances between pins and the kind of timber. If these vary, give the details of each uniform section and name the sections.

(26) Are any of your cross-arms creosoted, painted or treated with preserving compounds? If so, state how many and where, giving kind of treatment.

(27) Give the dates when cross-arms were put up and if they have been replaced give the dates when this was done.

(28) Were your cross-arms obtained under specifications and were they inspected before acceptance? If so, please furnish copies of specifications.

(29) Are your cross-arms attached by lag bolts or

through bolts? If the former, how many lag bolts are employed? If this varies, give the details of uniform sections and name the sections.

(30) State the distance between cross-arm gains.

(31) Are cross-arm braces used? If so, give all dimensions.

(32) Under what circumstances are double cross-arms employed?

(33) What kind of timber was used for pins and was it treated? What kind of treatment?

(34) Give the kind of pin employed and its dimensions.

(35) What kinds of insulators are employed?

(36) Were pins and insulators obtained under specifications and inspected before acceptance? If so, please furnish copies of specifications.

(37) Were insulators subjected to electrical strain and leakage tests before acceptance? If so, please state details of tests.

(38) How many wires were originally erected on your pole lines? What kinds and gauges?

(39) What wires have since been erected and when? Give kind and gauge.

(40) What wires have been replaced? State which original wires were replaced and with what kinds and gauges of wire they were replaced.

(41) Were your wires obtained under specifications and inspected before acceptance? If so, please furnish copies of specifications.

(42) Were your wires subjected to tests of galvanizing.

tensile strength, elongation and electrical conductivity before acceptance? If so, please state details of tests.

(43) What amount of sag between supports was specified and used in erecting your wires?

(44) How are your wires tied to the insulators? With what kind of tie wire?

(45) How are joints in line wires made? Are they soldered? If sleeves are used, how many turns are given and what kinds of sleeves are in use?

(46) Were your lines erected under a general specification for pole lines? If so, please furnish copies of specifications.

(47) Are lightning rods in use on your lines? If so, state how frequently and how they are installed, giving details of earth connections.

(48) Are your lines protected at crossings with lines of telephone and telegraph companies? If so, please furnish descriptions of the kinds of protection in use, with diagrams.

(50) Have you records of the cost of construction of your lines, showing the initial cost and the cost of additions, extensions and replacements? Also the cost of erecting screens or other protection at crossings with the lines of telephone and telegraph companies and power lines? If so, please submit a statement of the same in detail, giving the initial cost and the cost of each addition, extension and replacement, separating the total cost into labor, materials, freight, traveling and supervision.

MAINTENANCE.

(51) Have you an organization for the maintenance of your lines?

- (52) What official has charge of this organization?
- (53) Of how many does this organization consist and what are their duties?
- (54) Give the location of your testing offices and the distances between them.
- (55) How frequently do you make periodical wire tests, between the offices last mentioned, to ascertain the condition of your wires?
- (56) By what means do you ascertain the location of wire trouble?
- (57) How many linemen do you employ to clear wire trouble? Are these men assigned definite portions of line in which they clear the wire trouble? If so, please give the sections assigned to each lineman.
- (58) Do the linemen last mentioned also keep up the general maintenance of lines, such as replacing tie wires, insulators, joints, pins and cross-arms, pulling slack, trimming trees and foliage, clearing kite strings and dead limbs of trees, tightening slack guys, inspecting cable boxes, lightning arrestors, fuses, soldered joints and bridle cables, etc.? If the linemen are not assigned to the work, state by whom it is cared for.
- (59) How frequently are periodical inspections made of your lines to ascertain their general condition and to note the manner in which work such as mentioned above in No. 58 is performed? By whom are these inspections made?
- (60) By what means do you determine the necessity for replacing poles and cross-arms? Please describe this in detail.
- (61) How frequently do you inspect your poles and

cross-arms, by the means described in reply to No. 62, to see whether replacements are necessary?

(62) How do you handle replacement work? Do you take care of it with your regular force or do you organize a temporary force for the purpose? In the latter case, under whose direction is this force placed?

(63) Do you keep records of wire trouble, noting location, time reported, time cleared, cause and time occupied by lineman in clearing same?

(64) Do you compute, for each month, the total possible wire-mile-hours of service if there had been no wire trouble and compare with this the wire-mile-hours which were lost because of wire trouble? If so, please furnish the figures for the past 10 years, if available.

(65) Do you keep records of pole line failures, noting location of failure, immediate cause, time failed, time service was restored, number of poles down and the weather conditions? If so, please give the above details of failures for the past 10 years and the dates on which they occurred, the age of the poles, whether failures occurred on curves or tangents, state how the poles were guyed or braced and give the direction of the line by points of the compass.

(66) Can you state whether the above failures could have been prevented by setting poles closer together, by poles of larger diameter, by shorter poles or by additional guys or braces? If so, please specify what would have prevented each failure.

(67) Do you keep your records of wire trouble, mentioned in No. 63, classified according to different kinds and gauges of wire and do you compute the number of troubles per mile of wire per month for each kind and gauge of wire?

If so, please furnish the figures for the past 10 years, stating the ages of the different wires.

(68) Can you state whether the frequency of wire trouble, referred to in No. 67, could have been reduced by stronger wires, shorter spans and more sag or dip of the wires between supports? If so, please state specifically what measures would have reduced the wire troubles.

(69) Do you make periodical resistance measurements of iron and steel wires to know their condition and determine their rate of depreciation? If so, please state how often and state the annual rates of depreciation of such wires on your road, for each kind and gauge.

(70) Have there been occasions when service was totally interrupted by wire failures, although no poles were down or broken? If so, please state the dates of such failures, lengths of interruption to service, immediate causes and weather conditions.

(71) Could the failures mentioned in No. 70 have been prevented by any of the measures enumerated in No. 68? If so, please specify as in No. 68.

(72) Do you keep records of the cost of maintenance? If so, please specify the manner in which they are kept.

(73) Can you state the total cost of maintenance per annum, dividing this total cost into the cost of wire testing, the cost of clearing wire trouble, the cost of the general upkeep and inspection of lines, the cost of making replacements, the cost of repairing line failures mentioned in No. 65 and No. 70 and the cost of making line alterations or changes in location which are charged to maintenance? If so, please give the figures for the past 10 years.

(74) The total cost of maintenance will vary with the

number of wires on the poles, the number of poles per mile and the age of the line. Can you further divide the costs asked for in No. 73, into the figures for each uniform section of line, so that conclusions may be drawn between lines carrying different wire loads? If so, please give the figures for the past 10 years, naming the sections.

(75) What is the most economical line to maintain on your road, considering the total maintenance cost per mile of wire, as regards the size of poles, the number of poles per mile, the amount of guying and bracing, the number of cross-arms, the number of pins per cross-arm, the kind of timber used for poles and cross-arms, the sizes of wire and the kinds of wire? Where is this line located?

(76) Have you had any experience with poles other than timber, such as steel, iron or re-inforced concrete? What can you say regarding their first cost and cost of maintenance?

(77) Have you tried any means of preventing decay of poles at and just below the ground line? If so, what can you say regarding their cost and their effect on depreciation of poles?

(78) Do you bank earth or stones around your poles and why?

(79) Is it the custom of your road to charge the telegraph department with the overtime of train crews caused by delays to trains which result from failures of the telegraph lines? If so, can you state what this has amounted to, each year, for the last 10 years?

(80) If this amount were capitalized at 10%, would it, if invested in stronger lines, have prevented the line failures which occasioned the delays to trains?

(81) Are accounts so kept on your road that the different items entering into the cost of line maintenance can be obtained from the Auditor, or is it necessary for you to analyze the Auditor's accounts in order to arrive at these items?

(82) Do you consider that your expenses for maintenance are such as to secure the best results? Should they be increased or diminished?

The recommendations of each Superintendent of Telegraph are desired as to whether the lines on his road can be so improved upon as to reduce the cost of furnishing uninterrupted service, taking into account the reduction of overtime payments to train crews by providing continuous telegraph and telephone service. It is desired that each Superintendent give his recommendations below, in detail.

(83) Size of poles and kind of timber, for lines of 1 to 40 wires; depth set in ground.

(84) Number of poles per mile.

(85) Size of cross-arms, number of pins, kind of timber, treatment for preservation, through bolts or lag bolts, and whether braces should be used.

(86) Amount and kind of guying and bracing on corners, curves and tangents; amount of rake to be given to poles on corners and curves.

(87) Kind of pins and insulators; kind of tie wires and joints.

(88) Kind and gauge of line wires; tensile strength and elongation. Amount of sag to be given in spans varying from 50 to 200 feet.

(89) Should protecting screens be installed at crossings with telephone, telegraph and power lines?

(90) What method should be adopted for inspecting poles and cross-arms to determine when replacement is necessary?

(91) In what manner should the accounts of the Telegraph Department be kept to bring out clearly the several items in the cost of maintenance, so that the Superintendent can handle the maintenance most economically?

(92) Do you favor the arrangement of having the Telegraph Department charged with the extra expense incurred by the Operating Department on account of interruptions to the telegraph service caused by line failures?

Signed.....

Superintendent of Telegraph.

President Griffith: This is a very interesting paper and certainly requires consideration which we haven't time to give it. It might be wise to simply have it printed in our minutes where we can study the questions carefully.

Mr. Groce: I move that the paper, including the questions, be treated as the report of the committee on wire crossing legislation and sent out to the members with that. As I understand it it will not be a very arduous task because it is in such shape it don't have to be submitted for correction or anything of that kind. Each member can then make his report as soon as possible after receiving the questions.

Mr. Chenery: This committee will be continued, as I understand it, and, before they can make their final report they must have replies to the questions submitted. This

committee wants something to work upon. I, therefore suggest that we have this printed separately.

The motion as made by Mr. Groce was seconded,

And agreed to.

Secretary Drew: Before the last committee, of which Mr. Davis is chairman, reports, by request of those who are here and have written papers, realizing where we are at. I would suggest these papers be simply published without being read: "Standard time," by W. J. Camp; "Error Sheets," by R. L. Logan; "Railway Telegraph Service," by W. J. Browne; "Visible Supply of Telegraph Poles," W. W. Ashald; "Uniformity of Office Installation," by E. Parsons. I move these papers be put in the minutes without being read or discussed at this time.

Which was seconded.

Mr. Ryder: It does seem to me it is too bad to call on the members to prepare papers and then have them go by the board as this motion proposes.

President Griffith: You must bear in mind this is at the request of the writers.

Mr. Ryder: That is due to their modesty. I am sure.

Mr. Dailey: Are we to have an afternoon session?

President Griffith: I believe it is the wish of many to go away on the afternoon train. If we have an afternoon session there will be almost none present.

Mr. Groce: I endorse Mr. Ryder's sentiment. It might be well to ascertain how many would stay and continue the meeting this afternoon.

Secretary Drew: I have to smile every time I hear anybody say anything about things being rushed through. If

you will find an association of railway men, or any other men, in the United States, that has given more hours to actual discussion and listening to papers than we have done at this meeting, I will be willing to take a back seat and say that we are certainly rushing things. But, until you can show that, I think it is quite to the contrary. We haven't rushed things. The Car Service Association, of which I am a member, doesn't begin to put in its two sessions in the year, the number of hours that we have put in at this meeting. But it is easy to understand, to a certain extent, for their work is done by committees. Everything is referred to committee. The committees meet and thresh these things all over, and when they come to the meetings they simply present the recommendations and that ends it—very little discussion on the floor. I think it is a mistake to do it that way. I think we do it in a much better way and get more information in regard to the various topics that are brought up. But there is a limit. There is an eight hour law in this country. The first thing you know some of you fellows will be fined if you don't quit going at this pace. As two of the men are here and have made this request, as three are not here but have simply sent papers, as many members want to leave on the 2:15 train and others on the 4:45, it seems to me it is certainly very reasonable that we take these papers and publish them in the minutes without their being read at this session.

The motion to print the papers without reading, was agreed to by the following vote:

Yeas	9
Nays	5

STANDARD TIME.

By W. J. Camp, Electrical Engineer, Can. Pac. R'y's Tel.

The subject of "Time" is one which could, in the hands of a good writer, be made very interesting if followed up from the earliest days; but as this Association is more concerned in the present requirements than in ancient history, I will not take up your time in tracing the various systems in vogue since the creation for determining the divisions of the day.

A vital necessity in the safe and efficient handling of trains, is that all clocks and watches must indicate uniform "Time." Many serious accidents have resulted from a difference between the time-pieces of two employees, and, during the last few years, most of the railway companies on this continent have spent a great deal of money towards securing uniformity throughout their systems.

The Canadian Pacific Railway Co.'s management recognizing the great importance of a uniform Time system, has established a Time Service Department under the supervision of Mr. J. J. Houghton, to whom the writer is indebted for a large part of the matter contained in this paper.

The daily transmission of Time signals is looked after by the Telegraph Department, and the following description of the method may be of interest. On account of the very long circuits worked, it has been found best to transmit the signals by hand. At 11:53.50 the preliminary caution "Bk Time" is given by Montreal on all duplexes and half quads over which it is desired to send the signals, as a warning to the various repeater offices to cut in their combinations. The single wires are then cut in at Montreal and other points are switched on, and a second warning of "Time"

is given, then single beats are made corresponding to the swing of the main clock pendulum, by alternately closing and opening the circuit each second; the beats are therefore one second in length. These are continued until 11:54.50 when the circuit is left open for ten seconds. At exactly 11:50.50 a long double beat is given and continued each alternate second until 11:55.50 when another pause of ten seconds is made and at 11:56.00 a double beat completes the transmission.

The repeater arrangements at Montreal consist of five relays of 75 ohms each connected up in series with an ordinary Morse key in a ponk circuit. The lead from the local dynamo to the desired duplex and quad tables passes through the contact points of one relay. By means of the loop switch any duplex or half quad can be thrown into the combination. The positive and negative 130 and 200 volt dynamo leads pass through the contact points of the other four relays to the various single wire—a by-path is provided so that any leased or other wires over which “Time” is not to be sent can be switched out of the combination.

The sparking at the relay contact points is almost nil, but should it become too great by adding more circuits, a small condenser would reduce it. A similar arrangement is used at all repeater offices where storage or dynamo current is employed, the pony circuit being worked by the relay on one of the incoming circuits.

At points where a repeater office is equipped with gravity battery there is seldom more than one or two side lines to connect up for time and in these cases an ordinary relay is employed for each of such lines. The combination at the various repeater offices are made up at 11:30 or even earlier,

but the pony circuits held closed by a button switch until the warning signal is received from Montreal, when it is only a moments work to turn the switch and throw into the "Time" circuit all wires on which it is desired that the signals be sent.

C. P. R. time is regularly forwarded to Fanning and other islands in the Pacific Ocean and to Bermuda, Jamaica, and the Azores Islands in the Atlantic. Officers on vessels of the British navy frequently check their chronometers with this time at Vancouver, B. C. and Halifax, N. S., and of the Germany navy at the Azores.

A few words as to the accuracy of the "Time" may be mentioned here. Some years ago a long series of observations were carried on by astronomers of the Dominion of Canada and Great Britain and signals exchanged over the wires of the Canadian Pacific Railway and cables of the Commercial Cable Company. An astronomer was located at Montreal, one at Canso, one at Waterville, Ireland, and one at Greenwich. Each astronomer was stationed at each of the above points in turn, in order to eliminate the personal error. Signals were exchanged in each direction giving the transit of various stars over the meridian. Finally the land lines and cables were connected through repeaters and signals exchanged both ways direct between McGill Observatory, Montreal and Greenwich, as a check of the preceding results. From these observations was obtained the true longitude of Montreal. I believe that afterwards Washington, D. C., and various other points on this continent checked up their longitude with Montreal.

A master clock at McGill Observatory sends out signals over a circuit connected with an ordinary sounder in our

main office. This clock is closely regulated by a sidereal clock at the observatory which in turn is frequently checked up by observations of the stars.

We have on several occasions noticed that the "Time" given over the railroad lines in the United States has been as much as three seconds in error. We are satisfied that our own standard was right from the fact that the reports from the various comparison clocks on the system showed a uniform variation while the signals coming in over the N. Y. C. R'y's wire jumped two or three seconds in one day coming practically into unison with McGill.

Comparison clocks (No. 17 or 18 Regulator Seth Thomas) are located at all divisional points. At all comparison stations a daily record is kept of the clock variations and a report sent to the Chief Inspector at the end of each month. This report shows the seconds fast or slow and when the clock is wound, set or regulated. Each month these reports are checked up and the average weekly rating ascertained from which a statement is compiled and a copy sent to each Master Mechanic, Superintendent, General Superintendent, the Vice-President, and General Manager. The time inspector visits every station from one to three times per year and checks up the handling of records. All way stations are supplied with a standard telegraph clock (Seth Thomas), variations are recorded daily in same manner as comparison clocks.

Watch Inspectors are located at all divisional points. They are practical watchmakers doing a regular business with the general public. It is their duty to see that all Train Masters, Road Foremen of Locomotives, Locomotive Foremen, Road Masters, Bridge and Building Masters, En-

gineers, Firemen, Conductors, Train Baggage-men, Brake-men, Yard Masters and Yard Foremen carry watches up to the required standard and that the watches are regularly cleaned. For this purpose the Inspectors are advised by the proper official of the railway of all changes in the staff of the above mentioned employees.

The minimum standard of excellence adopted is a grade known among American movements as 17 jewelled, double roller escapement, Brequet hair spring, patent regulator, adjusted to temperature, isochronism and at least five positions, and corresponding to Waltham Appleton Track & Company "Nickel Premier"; Ball, "Official Standard" 16 and 18 size; Elgin "B. W. Raymond nickel"; Hampden "New Railroad"; "Illinois Bunn"; Hamilton "936", and all grades equal or above, also Swiss movements complying with these specifications, the variation of which must not exceed 30 seconds per week.

Watches which were in service prior to the reorganization of the "Time" service, October 1st, 1899, may remain in use subject to the approval of the Chief Inspector as based on the record of their performance, or on actual test in his office of their reliability. Almost every one of these watches had been removed from the service.

Employees required to carry standard watches must submit them for half-yearly inspection to the Time Inspector of his division, and receive a certificate that it is satisfactory, a copy of which is forwarded to his superior officer and duplicate to the Chief Time Inspector. In addition to the half-yearly inspection, employees must submit their watches to the Inspectors for comparison with standard time within the first and third weeks each month, and the

Inspectors keep a record of the rating. Failing to make such comparison the employee is not eligible for duty without an order from his Superintendent. No charge is made for these comparisons. Cards for keeping record of these ratings must be carried on the person subject to inspection on demand of a superior officer. Employees must not set or regulate their own watches, unless a watch stops through neglect to wind it. Watches must be cleaned at least once in fifteen months. The rate card must be filled in, in the presence of the employee who is required to initial the corresponding entry in the Inspector's rating book.

When a watch is repaired or cleaned by other than an inspector, it must be submitted to the Inspector for approval before being used in the service. When left with an Inspector for cleaning or repairs a standard watch will be loaned to the employee free of charge until his own is returned to him.

Inspectors are required to have a thoroughly accurate seconds pendulum clock and must ascertain the error thereof to the nearest second at least once each day by comparison with the Standard "Time" sent over the company's telegraph wires. A local circuit is extended from the contact points of a telegraph relay in the station to each Inspectors place of business for this purpose. A similar circuit is provided for round houses, etc.

There are a number of rules and instructions to the Inspectors regarding cleaning, etc., which it is not necessary to mention here.

This company has only installed electric clocks at Montreal and Winnipeg general offices and stations. At Montreal there are 81 clocks on five circuits worked by one master

clock. These circuits obtain current from a small storage battery which is kept continually charged by a lead from the 25 volt local motor-generator in the main telegraph office a mile distant. The five circuits are worked in multiple from one pair of cells—I believe the C. P. R. was the first to work clock circuits in this manner. At Winnipeg there are 37 clocks on two circuits.

Results since the establishment of the present time service have been very satisfactory. On one trip across the continent by the Time Inspector he found that the average variation of all comparison clocks was less than 5 seconds from Standard time.

ERROR SHEETS.

By R. L. Logan, Sup't. Tel'gh., K. C. S. Ry.

The Committee on Topics was evidently very kindly disposed toward the writer, judging from the subject assigned me, but I feel that there is very little out of the ordinary I can say which will interest you.

Error sheets occupy an important place in the Telegraph Company's Check Bureau, as they consist of differences in the "checks" of the office with whom business is transacted, and so little appreciated by the average recipient, who generally considers that he is being called upon to remit, or, as oft-times expressed, "donate" money to the Telegraph Company, whereas he is simply remitting funds no doubt collected, which he has had free use of for several months; as one of my former employees expressed it when called upon to remit for several deficits, "that he did not propose to furnish me with cigar money," but meeting him several years afterwards, stated that if I would send him the sheets, he would be glad to pay any amount of deficits

charged against him, which he did promptly. On inquiry as to cause of his change of heart, I learned he had but recently joined the church and was endeavoring to live up to its teachings.

On receipt of sheets in question, it has been my practice to record them in full in book kept for that purpose, so as to be in a position to make up duplicates in case original becomes misplaced or lost, and not delay its investigation waiting for copy from New York. Attached thereto is the following instructions:

“Manager Western Union Tel’gh. Co.,

Dear Sir:—The enclosed Error Sheet for the month of 190.., is sent to you for prompt investigation and adjustment. Business for the month during which these deficits occurred will be destroyed the 1st of, after which date original messages on which you are checked cannot be furnished. Therefore, unless this sheet is investigated promptly, you will be held responsible for the amount of the deficit, whether or not you were manager of the office at time deficits occurred.

Read the printed instructions on back of sheet, compare your records, and if they agree with what the sheet shows, and you are unable to locate in your files sufficient number of messages to agree with the other offices’ checks, fill in the amount on card 47 enclosed, and mail to offices with whom differences exist. Make memorandum on separate piece of paper of the date on which cards were mailed, and if replies are not received in ten days time, notify this office, ENCLOSING A DUPLICATE POSTAL CARD, PROPERLY FILLED OUT, and I will obtain replies or relieve you of the responsibility.

If you are checked out before the investigation of this sheet is complete, turn it over to the incoming agent, with all papers and explain to him what has been done, and the necessity of its prompt investigation. Take his receipt for same and forward it to me.

I would advise making note of all correspondence regarding error and uncollect sheets, as it is a matter involving money and records should be kept of it, that subsequent managers may know what has been done, also make all remittances by Wells-Fargo & Co.'s Express, thus giving you a receipt."

Ten days after sheets have been forwarded (which are sent by registered mail, that those who may be so inclined, cannot claim that papers were never received), offices who have not up to that time mailed receipt cards, are requested to acknowledge their receipt. Twenty days after mailing, those who have not up to that date returned sheet, are notified that such and such error sheet is due in my office within ten days, and to please hurry its investigation and return. I find that this is a good idea as it never fails to bring in quite a number, complete, or practically so, accompanied by duplicate cards. The instructions attached to error sheet are rigidly enforced; those receiving same are held responsible for the full amount of deficit if not investigated promptly or before the business for the month in which it occurs is destroyed, whether they were manager at the time report was made or not, and I find that being thus called upon to pay one deficit of this nature is sufficient.

Uncollect sheets are handled practically in the same manner, excepting that instructions as follows are attached thereto:

“Manager W. U. Tel. Co. Office.

Dear Sir:—The attached uncollect sheet is on account of your not reporting properly messages sent collect, reported to you by service message as uncollected. Please observe rules 13, 58, 72 and 76 in Tariff Book and avoid such discrepancies in future.

Please return this sheet to me within Five (5) days, either fully explained or remitted, and oblige.”

All error sheet inquiries received are forwarded, accompanied by an endorsement from my office, and is returned to the office or party from whom received in same manner; all endorsements being written in duplicate, which gives me a complete record of it, and when an office on our line fails to reply thereto before business is destroyed, the employees receiving same is called upon to remit for his negligence.

In conclusion will say that the instructions just received from the Telegraph Company that files be retained for eight months instead of but six will enable us to investigate more fully all deficits, thereby securing evidence in support of same so that collection can be made, when not explained, from whoever may be responsible. Heretofore, oftentimes error sheets were received only 30 days before business for that month would be destroyed, and while 30 days would be sufficient time if the office receiving them would handle as promptly as they should, and inquiries from other offices receive like attention, but so far I have been unable to conjure up any untried schemes or ideas that in any way would improve upon my present method in handling this important detail.

With all due apologies to my hearers (excepting the

Committee on Topics) and my thanks to our esteemed friend, Mr. for his courtesy.

Very respectfully,

R. L. LOGAN, Sup't Telegraph.

RAILWAY TELEGRAPH SERVICE.

By J. C. Broune, Little Rock, Ark.

Foreman of Construction, Missouri, Pacific Railway Co.

In common with the duty of every head of a railway telegraph department, there is continued strife to sustain an organized service relevant to the demands of every official connected with the system. Making and maintaining a good service, is not any more confined to the ability of the Superintendent of Telegraph as a telegraph man, than it is to his support from subordinates. Capability is always successful to an extent, but when it is recognized and supported by an undercurrent of patronizing confidence, perfect attainment follows.

On most roads all messages filed by officials and their representatives are accepted without question as to indispensibility, or limit in the number of words, a condition that invites unceasing increase in the volume of business and diligent exercise in the most effectual method of handling it. On western roads especially, my observations have determined that the number of railroad messages and telegraph reports have gradually increased from year to year.

If for on other reasons, this condition is due to shortage of railroad equipment; the urgent need of keeping it in constant action, and the compulsory demands made upon railway officials by patrons to keep them advised of the whereabouts of every shipment, from originating point to

destination. Modern railroad management keeps in closer touch with every detail of operation and maintenance, as also shrewd competition serves to nourish a legitimate increase in the number of messages handled, but the pernicious habit of using the wires indiscriminately in preference to the mail is never at a discount.

The excellence of every railroad telegraph service is confined to the befitting management of a certain number of the most important office on the system. The elements of an appropriate distribution of operating force, and the most useful arrangement of circuits, define triumphant administration. A pertinent inspection will disclose where the bulk of the business originates and through what offices it must pass. In instances the comparative few in number may be amazing.

Arriving at the ranking importance of each office, calls into action a distribution of force with all the best qualifications to perform the varieties of service at each station. It is true that many railroad systems are somewhat hampered in placing preferred men, by seniority clauses contained in approved agreements existing between the operators and the company; but it is contended that these seniority rules, as I have seen them, may be applied without forcing incompetent men into positions of importance. If the superintendent of telegraph creates these positions and arranges the salaries, seniority should be required to fully qualify, before a single position is filled.

Every telegraph office that is kept open under strained conditions, by reason of short or incompetent force, is a hazardous and expensive venture for the company; for as long as the wires are cut in at a station, dispatchers will

depend upon making some use of the office, regardless of the efficiency of the operator employed, and to add to this, it may be truthfully said, from the significant to the most insignificant, every operator employed must be relied upon for competency and safe judgment.

Possibly "scarcity of operators" is caused by an effort tending to maintain too many offices, with a blanket allowance for telegraph service. If the necessity of the number of offices maintained were as constantly and carefully examined into, one by one, as the salary of each operator is checked monthly by the auditor's office, would not many offices be closed? and if, when these practically useless offices were closed, an amount of the money saved could be used in making salaries at other offices more attractive, would the shortage of operators decrease, and would the reliability of the service improve?

But the insufficiency of reliable and expert operators is one of the telegraph problems of today. An uninterrupted energy to improve mechanical equipment and to construct infallible lines has prevailed until our plant is about perfect for operation. Yet the operator remains answerable for the number of messages handled; the accuracy of execution, and the net profits to be derived from the expense of maintenance.

In general, with present office and line facilities, securing an adequate and competent force of operators to handle the existing and future volume of business, is more appealing than indulgence in inventive mechanism.

Telegraphy is only a temporary field for the entirely ambitious young man, many looking upon it not as a vocation to follow, but, using it as a stepping stone for profes-

sions which offer quicker advancement to better pay. Nevertheless, the limited and deformed opportunities of today for learning the art, do not attract all of the better class of boyhood, and as long as these conditions continue, a large per cent. of the offices will be manned by a transient material made and picked up by circumstance.

We have our Eckert, Clowry, Edison, Barelay and Bristol who have crowned an imposing facility fitted to convey the rapid dialogue of commeree, but the all-important genius is yet wanting who will originate a scheme, or a plan of discipline and instruction by which trustworthy operators will be made and supplied on demand.

THE VISIBLE SUPPLY OF TELEGRAPH POLES.

At the beginning of this paper, I desire to apologize to the Convention for the meagre details which I am able to present upon a subject which so closely concerns each Company here represented.

I accepted the assignment of the subject in all good faith, and hoped to secure a fund of information that would be of interest to each of us, but since April 5th, my entire time has been taken up with Committee work in the preparation of a Uniform Code of Train Operating Rules for the Railways in the Dominion of Canada, and my opportunities for collecting data upon the subject have been limited.

I assume that the conditions affecting the present supply of Cedar telegraph poles in the United States, are pretty generally understood by the majority of our members, but I shall endeavor to briefly cover the situation.

For many years the source of supply has been confined to the forests of Northern Michigan and Wisconsin. Dur-

ing the past ten years the demand has increased to such an extent that, estimating the future by the past, the present standing timber will be practically exhausted in the above regions within the next ten years, and as there is no other visible source of supply in the United States, it is a live question with all Companies to cast about for some sort of substitute. Already experiments are being conducted along these lines, and the Convention is to be favored with a paper upon this subject, which will be thoroughly appreciated by each member.

In view of the rapidly diminishing supply of Cedar in the United States we quite naturally turn to our growing neighbor to the north, a country which has but recently attracted the attention it merits, but which is now advancing by leaps and bounds. Wherever the railways go, the telegraph and telephone follow immediately, and poles must be provided.

I recently approached the Manager of the Grand Trunk Pacific Telegraph Company, to obtain the necessary data as to the conditions in Canada, knowing that he had but recently made an exhaustive inquiry into the subject, as he is commencing the construction of some five thousand miles of telegraph lines. To my inquiry as to the visible supply of telegraph poles in the Dominion of Canada, he replied: "There hain't none." However, he informed me that there are considerable quantities of Cedar standing in the low or swamp lands through Northern Quebec and Ontario, but that it is generally found in pockets and not over any considerable areas. The greater amount of this timber is found some distance back from present transportation facilities, but with the building of new railway lines, will be more accessible.

It is quite probable that the home demands will utilize the visible supply in Canada, as several thousand miles of new railways are to be constructed in the country within the next few years.

In view of the conditions as presented from the limited investigation that I have been permitted to make, I am convinced that the visible supply of timber for telegraph poles will have been used up within the next ten years, and that the future will provide the substitute.

W. W. ASHALD.

UNIFORMITY OF OFFICE INSTALLATION.

By E. Parsons.

It would probably be better, in considering the question of Uniformity of Office Installation, to view first the practice of non-uniformity.

It is too true that as a general proposition the style of architecture of our station buildings is not such as to allow, without considerable expense, much elaboration in the way of office installation. Do we, however, do all we can with the space and layout allotted? It would seem that a means of preventing the haphazard method of placing keys, relays, sounders and resonators, such as prevails, could be found.

Is it necessary to have incoming cables enter offices in so many different ways? It is a common practice to bring cables into offices at some point near the ceiling, but, as a rule, there uniformity ends. Some are left hanging from the point of entry, some are fastened to the wall by pipe straps, some by billet leather, some by marlin, staples or wooden or porcelain cleats. Some are brought to the right side,

others to the left side of the board. In some cases all of the strands are placed in binding posts, if there are sufficient binding posts, in others only such strands are required for immediate use are placed in binding posts, while the balance are curled, tied or nailed up, or left hanging loosely. In some cases the instrument wires leading from the board are in cables, single wires tied together or single wires cleated to the wall in a manner suiting the taste of the installer. Relays, keys, sounders and resonators are placed, not always with a view of convenience as to work or space, but with an evident desire, on the part of the installer, to throw them in, in as short a time as possible.

In planning uniform installation of offices it appears desirable to divide them into three classes: One class to include all general and relay offices, another class combination relay and train order or relay and dispatcher's offices and the third the ordinary yard or small country office. It is easy to make an installation of the first class for the reason that one size table will do for any wire; unless a large number of blanks are handled the regular standard Quartette or Sextette tables can be used. The switchboard should be placed with a view of securing good light both at the front and rear. The cable coming to the office should terminate in some form of binding post so placed that the cable strands may be easily dropped to them in such a convenient manner as will allow the lacing of the exposed strands. We use what is known as a lock nut strip for binding posts. These strips are nothing more or less than binding posts mounted on a composition insulated base, two posts being mounted on one base. The two posts are connected by a brass strip the purpose of which is to allow a quick means of getting in on a wire for test or other pur-

pose. The cable strand and jumper wire need not be molested when a wire is opened, all you do is to take off the strip. We place in a vertical row as many of these lock nut strips as are needed to take care of all the strands in the incoming cables; about three inches from this row we place another row, from which are run the wires to the lightning arrester. For this purpose we use standard fourteen gauge office wire as furnished by the Telegraph Company, lacing them on a made form to fit the dimensions of the work. We then have the wires from the outside ending in one row of strips and the wires to the lightning arrester starting from the other row of strips, located three inches from the first. All that is necessary is a small jumper to make the connection from one to the other and, if at any time, a change is desired, either on account of defective cable or on account of moving the wire to a new position in the board, all that is necessary is to take off your jumper wire and put on another. The cables coming in and the form leading to the lightning arrester need not be molested. The lightning arresters are placed in a row horizontally, so that the far end of the form previously mentioned will reach the fuse end of the arrester, thus bringing your line wire to the fuse before it passes the lightning arrester. From the lightning arrester end of the fuse we put in another made form consisting of the same size office wire which leads to the binding post at the base of the board, thus completing the circuit. As a ground for our lightning arresters we use two number fourteen wires, twisting them each half around the screw or bolt that is provided on each arrester. A sufficient number of lock nut strips are used to make the connection between the instrument cords and the cables leading to the tables. These we generally place

directly under the left hand side of the board, as you face it, for the reason that more of our working wires are on that side. Where all wires in the office are on instruments these strips are placed under the entire length of the board. Leading from these instrument strips to the table we use office cable of just sufficient capacity to take care of the table, placing an eight conductor cable for a quartette table and a twelve conductor cable for a sextette table. It is rarely necessary to leave extra strands in an installation of this kind. The same kind of cable is used for local batteries as for instruments. If the installation is made at a point where we have gravity battery, the battery cables are placed on the front of the battery stand, just above the top of the jars, generally parallel with the bottom of the next shelf above. The cable is fastened by billet leather and just one pair of wires brought out to wood binding posts for each battery. The binding posts are so placed that the wire from a copper will reach them. It is necessary, of course, to run a jumper from the zinc. This arrangement also does away with the necessity for disturbing the cable strands when a change is desired or a battery cleaned. The telegraph tables must necessarily be placed with a view of utilizing, to the best advantage, the space available. This is especially true in rented buildings, where each square foot of space means so much expense. While planning to utilize the space to good advantage, however, the question of light and room for the operators should not be lost sight of. You place the tables for men to work at, they can only do their best work when the conditions are the best. If they can see where their comfort is being looked after they will take the most pains and turn out the best work. This is the plan of wiring and placing of tables followed by us in the first class of offices.

The same plan is followed at the second class of offices as to wiring, but we provide special size tables for the operator whose duty it is to handle train orders and car reports. We find by allowing table space of five feet by two and a half feet (practically what is allowed for an ordinary train sheet) an operator can readily handle the necessary train orders and take car reports if called upon to do so. In the ordinary yard office and country office we do not go to any elaborate system of wiring, but we aim to place all wires in a systematic workmanlike manner, using office cable from the board to the tables and for local batteries. If it is necessary to run single wires from different points to a common point we lace them together firmly, from the point they center, rather than to spread them out in cleats. Instead of curling or "pig-tailing" the wires, either single or from a cable, we leave a very small amount of slack, leaving them straight as possible. In the case of single wires this does away with a mess of curled dirt catchers, and in the case of cable it eliminates the cracked cable strand insulation with which we have all had experience. In offices where there are four or more sets of instruments, up to seven, we place a local spring jack. In offices where there are seven or eight instruments we place a main line spring jack. If there are more than eight sets there is work enough for two men and two jacks or two tables are installed. In one man eight wire offices are very few.

I hope some day to see the installation of offices further systemized. Why would it not be a good plan to say the "north" or "east" wire should only go to the front leg of the key, the "south" or "west" wire only to the back binding post of the relay and the back leg of the key should

always be connected to the front binding post of the relay? Why would it not be a good plan to say the zinc end of your local battery should always go to the right hand local post of the relay and the copper end of your local battery to the back, or right hand side, of the sounder, with the other post on relay and sounder connected? If all linemen were taught such a system it seems that there would be less occasion for blaming wire trouble to cables. There would also be less time lost in locating office trouble.

Mr. Chenery: The annual convention was advertised for the 19th and 20th, and I think a good many people who came here expected the convention would close after these two days. I think it is a mistake. We should have at least three days. Let us have it understood that we will advertise what we are going to live up to.

Secretary Drew moved that when the convention adjourn it adjourn to meet at Montreal, June 17, 18 and 19, 1908.

Which was seconded.

Mr. Cellar: Wouldn't it be possible to have the meeting a later date, say, the following week?

Mr. Chenery: Good suggestion.

Mr. Cellar: I think some of us would perhaps have difficulty in getting away the 17th of June.

Mr. Ryder: This is the same question that has been brought up before, caused by the fact that the date of our meeting ordinarily comes during school graduation week. But if the next week will answer I would be in favor.

Secretary Drew: I will change my motion to read the 24th, 25th and 26th, with the consent of my second.

The motion was agreed to.

Mr. Rhoads: My recollection is the secretary announced the death of two members. It has been customary in the past and I think it would be well to instruct the secretary to write the families of the deceased the condolence of the association.

Secretary Drew: I have written Mrs. Read. Mr. Mackenzie had not been a member for two years at the time of his death. He was never made an honorary member. For that reason, I said when I announced their death, that no action was necessary.

REPORT OF THE COMMITTEE ON UNIFORMITY.

Presented at the Convention, Atlantic City, June, 1907.

(As read by John L. Davis, Chairman).

At the last meeting of this Association a motion was made as follows: "That a Committee be appointed for the purpose of gathering together a sufficient amount of information to make a full and complete report on the subject of 'The duties of the Superintendent of Telegraph and rules and regulations for the telegraph department,' the committee to obtain an outline of the duties of the different Superintendents of Telegraph and if possible copies of the telegraph department rules in effect on various railroads, to consider first the most important points and submit with their report proposed rules that will cover those points. A copy of the proposed rules to be submitted to each member of this Association for a vote as to whether or not they should be adopted." The motion was duly seconded and carried and a committee was appointed as shown in the proceedings of that meeting, but unfortunately the subject title as shown in the appointment of committee (see book of proceedings, convention 1906) is misleading, and indi-

cates that it is the purpose of this committee to outline the Superintendent's duties, rather than those of the men under him. It was not contemplated by the mover and seconder of the motion to attempt to uniform the duties of the various Superintendents of Telegraph, as that is entirely outside of the province of the Association. It was the desire of the convention that the committee should secure an outline of the duties of the different members of the Association for submission with their report, so that the Association could act intelligently on rules for the telegraph department. We do not expect to establish complete uniformity, not even in one particular thing, immediately, but we feel that where there is a slight difference in the rules, that the Superintendent of Telegraph can, by his own personal effort, change the rule, or, if he hasn't the authority to change it, he can endeavor to persuade the officer to whom he reports to sanction slight changes, in order to bring about uniformity, where it can be done consistently.

At a meeting held in Chicago on March 14th, 1907, the work that had been done up to that time was gone over carefully and it was decided that further action could not be intelligently taken without obtaining from the different Superintendents of Telegraph an outline of their duties, believing that we should not attempt to outline rules for subordinates over whom our members have no control. A letter was there formulated which we thought could not be misunderstood, and it was addressed to every Superintendent who is a member of this Association, there being 57 in number. The result showed very plainly that the majority of the members misunderstood our purpose, because we received but 33 replies; 24 did not answer, 12 were non-committal, 8 were unfavorable and 13 were favorable.

It was rather discouraging to find that only 13 of the members of this Association were apparently in favor of assisting us in the work we were appointed to do, after receiving the impression in Denver that it was the unanimous opinion that the work was really considered necessary for the good of all concerned.

In the replies that were received we find that the duties of Superintendents of Telegraph vary widely, and we have found also that there is a wide field for the kind of work we are doing, because the lack of uniformity in rules is plainly visible; but after discussing and fully considering the nature of this work, we are positive that very little good can be accomplished without the entire good will and unanimous support of this Association. The matter is therefore submitted to the convention for any action it may desire to take.

Respectfully submitted,

Committee on Uniformity.

.W. P. McFARLANE,

F. H. VAN ETTEN.

Mr. Davis: I was asked not long ago to do some little work for the General Managers' Association and I was very much pleased to find while on that work that they are doing more to bring about uniformity in the telegraph departments than the committee appointed by this Association could hope to do. I, therefore, suggest that the committee be discharged and that no further time be taken on that account.

Mr. Ryder moved the report of the committee be accepted and distributed,

Bulletins, Form, and Messages on Hand.

President Griffith: There is one more little report which will only keep you a moment, and that is the report of the committee to confer with the American Railway Association as to state laws. That committee was created to prevent, if possible, power transmission lines from occupying railroad rights-of-way parallel with railroads. It is a known fact a good many of our roads are electrifying their systems. Others contemplate doing so in the near future. In view of this, together with the fact of the attitude of legislators at this time, after consulting officers of various roads and incidentally members of the American Railway Assn., we concluded that if we took the matter up with the legislature it might react. Furthermore, it might suggest to the minds of the legislators to do just what they have done in Arkansas. Your committee, therefore, desires to report progress.

Mr. Ryder moved the report be accepted,

Which was seconded,

And agreed to.

Mr. Ryder: I move that papers to be presented at future meetings be printed and distributed to the members before such meetings.

Secretary Drew: The motion is not seconded but I want to speak on it anyway. Twelve days before this meeting just two papers had been received at my office. Now, I will give any our printing friends a chance to say how much opportunity there was to get these papers printed, get them mailed in time to do anybody any good before the meeting. Four days afterwards two more papers came to my office, and with the two that came to my office was a full page correction on one of the two that had reached me first and a substitute paper for the other of the two that reached me

first. That left eight days to send these papers to the printer, get out the proof and for me to go over it, send it back to the printer, have him print it, come back to me to mail and get it to anybody before they came to this convention. Now, you cannot do it. If we are going to have the papers printed there must be a limit as to the time that these papers must be in the secretary's hands. I am well aware of the advantage of having these papers printed and distributed before the meetings, and, there are some disadvantages, but I think the advantages outweigh the disadvantages. I think it would be a good plan.

Mr. Chenery: Mr. Taylor, of the topic committee, is not here, but we had some correspondence as to the advisability of printing these papers in advance, and such members as were requested to prepare papers were, also, requested to have these papers in the hands of the secretary not later than May 15.

Secretary Drew: Not a paper was there on May 15.

Mr. Chenery: Inasmuch as that condition prevailed, it was then decided by the chairman to assign to each paper one or two members to discuss it. I think there are fourteen railway clubs in this country that issue proceedings monthly and I do not think there are two that attempt to publish papers in advance. The St. Louis Railway Club, with which I am identified, have discussed this matter a number of times. We have the proceedings of the New York Club and the Western Club of Chicago, who issue their paper in advance. I sometimes wonder whether we can expect as much interest in a paper if you know what it is. If you don't know what it is you anticipate something. That is the experience of the railway clubs.

Secretary Drew: That is one of the disadvantages I spoke of. I know that when we have sent out papers to some of our Superintendents and they have seen what was to be read, they have simply staid at home. And the officers of some of these roads have said to them, why you have the document here; study over them; keep at your work. Now, there is that disadvantage that I know of.

Mr. Cellar: I feel that a good deal of the delay to the special papers this year was caused by the fact the assignments were not made until late in March or early in April.

The motion to print the papers, having been seconded,
Was agreed to.

Mr. Ryder moved that no paper be allowed to be presented to the meeting that had not been furnished to the secretary in time to be printed and distributed to the members before the meeting is held.

President Griffith: Of course, we want to get in all the papers we can as early as we can, but if we decline papers presented a week before the convention you may loose some pretty good things.

Mr. Dailey: If the members could only have them when they arrive at the meeting.

Mr. Ryder: That would help some.

Mr. Chenery: Change your motion. (Addressing Mr. Ryder.)

Mr. Ryder: I move that no paper be allowed to be presented at our meetings that has not been furnished to the secretary sufficiently early to enable him to at least have advance copies presented to us on our arrival at the meeting.

Which was seconded.

And agreed to.

REPORT OF COMMITTEE TO PREPARE TRANSFER BLANK.

Mr. Davis presented the following report:
To the President and Members of the Association of Rail-
way Telegraph Superintendents:

At a meeting of the Superintendents of Telegraph held in Chicago, October, 1906, a committee was appointed for the purpose of gathering together a sufficient amount of information from the different railroads to prepare a blank that could be used on any railroad by telegraph operator in transferring train orders, bulletins, forms, messages, and any other unfinished business to the relieving operator.

The committee is composed of two members; but, unfortunately, they are located 840 miles apart, and it has been impossible for this committee to get together and handle this matter as it should like to have done.

Quite a good deal of information was, however, gathered together by correspondence, and a proposed form printed and sent to the different members of this association for approval under date of February 19th, 1907.

Some of the suggestions offered for improvement are as follows:

NICKEL PLATE—Recommends book form with additional space for over due trains.

TERMINAL RR. ASSN. OF ST. LOUIS—Recommends book form with perforated duplicate sheet, so that carbon copy can be made and forwarded to head quarters daily.

SOUTHERN RAILWAY—Calls attention to difference in normal position of train order signals.

UNION PACIFIC—Suggests larger space for number of

train orders on hand and recommends an additional space for trains overdue that have not passed.

ILLINOIS CENTRAL—Suggests radical change.

WABASH RAILROAD—Is satisfied with its present blank.

LAKE SHORE—Suggests ink record. One sheet for every twenty-four hours, with foot notes instructing operators to make record of storms, improper working of wires, unsafe condition of track, bridges, etc. The blank to be forwarded to the chief dispatcher daily.

KANSAS CITY SOUTHERN—Satisfied with its present blank.

COTTON BELT—Satisfied with its present blank.

SOUTHERN INDIANA—Suggests radical changes.

C. & A.—Satisfied with its present form.

M. K. & T.—Suggests slight change.

BIG FOUR—Recommends radical change.

MISSOURI PACIFIC—Fairly well satisfied with blank now in use, but would like to see something better, if possible.

SEABOARD AIR LINE—Satisfied with its present form.

C. & E. I.—Recommends radical change. The general manager of the C. & E. I. Railroad is awaiting the action of this convention before adopting any blank now in existence.

GRAND TRUNK—Suggests radical change. Recommends that the matter be introduced at this convention for the purpose of discussion with a view of arriving at a standard form applicable to any railroad.

Your committee has found that there is a very wide difference of opinion on this subject, and consequently got together on June 11th, 1907, and formulated a blank which it is thought will cover every objection so far offered.

Your committee thinks also that there is no good reason why uniformity cannot be established in this matter because it is within the province of the Superintendent of Telegraph to make his recommendation on this subject; each member can take up individually with his superior officer the question of adopting the form we decide upon if he feels so disposed. Recommendations made on this subject to be considered as suggestions only, with a view of strengthening what we believe to be a very weak point.

Considering the present agitation against railroads throughout the country, your committee feels that every precaution should be taken with a view of placing the responsibility where it belongs in case of accident; and considers the necessity for a satisfactory transfer blank very urgent.

Respectfully submitted,

W. W. ASHALD, Chairman,

JOHN L. DAVIS,

Committee on Operators' Transfer Blank.

A. B. & C. R. R.

TELEGRAPH OPERATORS' TRANSFER.

.....Station.....190.. Time.....M.

Condition of Train Order Signal.....

Position of Train Order Signal.....

Order No....Addressed to.....

Order No....Addressed to.....

Train Orders on Hand Order No....Addressed to.....

Order No....Addressed to.....

Order No....Addressed to.....

Bulletins, Form, and Messages on Hand.

.....

Switchboard or Wire Changes, from Normal Conditions.

.....

All overdue trains have passed except.....

Remarks:

.....

.....Retiring Operator.

.....Relieving Operator.

The above Record must be made in ink.

(Such other footnotes as may be desired.)

Mr. Davis: As I said yesterday, our general manager called on me some months ago for something of this kind. I hoped Mr. Ashald would be here today, because he has some very splendid reasons to offer for having a blank of this kind in use and having uniformity. I would like some action taken so I can say to our general manager this form is approved or disapproved by this association.

Mr. Walstrum: I see no mention made of transfer of Western Union accounts. I think that is an important matter. I have a good deal of trouble and I think some provision should be made for transferring commercial accounts.

Mr. Davis: The object of this blank is to protect ourselves in cases where an operator fails to transfer some very important railroad matter to the relieving operator. We have cases where an operator has failed to deliver an order. You have a question of veracity between the two men and it is hard to determine which is wrong. That is what the committee had in mind.

Mr. Chenery: I understood the committee was appointed to just take care of operator's transfers. I move the report of the committee be accepted and that this association endorse the form of transfer submitted.

Which was seconded.

Mr. Van Akin: Is this blank to remain in the office or is the operator who goes off to take it with him as a receipt. What is to be done with a blank of this kind?

Mr. Davis: We received some very splendid suggestions as to how this record should be kept. There are things we might talk on for two hours, but we have eliminated everything that we thought could bring about a difference of opinion and submitted for approval only the portions that we thought could be safely approved by every member.

Mr. Chenery: The method of handling the blank would be a matter of detail for each separate road.

The motion to adopt report and form of blank,

Was agreed to.

Mr. Dailey: I move a rising vote of thanks be extended to Mr. Chenery for his untiring efforts as president of this association.

Which was seconded.

President Griffith: As that needs no discussion and everybody feels the same way, I will put the question.

The motion was unanimously agreed to by a rising vote.

Mr. Chenery: I simply thank you. I want to say to you it is an honor to belong to this association. I get more information in coming to this convention than the meeting of any other body. When I first attended the meetings, some sixteen years ago, I got back in the corner and listened, and listened for several years, until I felt I had enough force back of me to get up and do something. If I have done enough to merit the good will expressed here I am certainly gratified. (Applause.)

Mr. Chenery: I move that this association extend a vote of thanks to the telephone companies, the telegraph companies, representatives of the wireless telegraph company, and such other people as have extended courtesies to us during the convention, including the Pullman Company,

Which was seconded,

And agreed to.

Mr. Rhoads moved the convention adjourn,

Which was seconded,

And agreed to.

P. W. DREW,
Secretary.

EXHIBITS AND EXHIBITORS.

The National Telegraphphone Company, of Rochester, N. Y., had on exhibition samples of three standard wall and desk type composite sets and portable composite set for the use of repairmen. These instruments are equipped with devices to eliminate the noise usually present and to insure perfect telephonic communication over working telegraph wires with no interference to either. The exhibit was in charge of Mr. Jay G. Mitchell, engineer. Mr. G. E. Milligan, the president of the National Telegraphphone Company, was also present.

The North Electric Company, of Cleveland, O., had on exhibition a fifty-line magneto switch-board equipped with forty locking signals and ten standard drops. This visual signal is said to possess many advantages over the usual form of manually restored or mechanically restored drop. In operation the operator's view of the signals is not obscured by existing connections as the jacks and signals are not mounted together as in all forms of mechanical self-restoring drops. The signal is operated by ringing current from the subscribers' telephone in the same manner as the standard form of drop, but when once actuated it locks into the exposed position displaying horizontal white bars and remains in that condition until restored by the insertion of the plug by the operator when it is restored to a normal condition. A standard five-bar bridging compact type wall telephone, standard five-bar bridging desk telephone, lineman's test set, ten and twenty-line non frame switchboards for small exchanges and samples of standard parts of equipment, were also shown. The exhibit was in charge of Mr. Jay G. Mitchell, engineer of the company.

A very interesting and novel working exhibit of light-

ning arresters was made by Mr. E. W. Vogel of the Railroad Supply Company, Chicago. Mr. Vogel exhibited several of this company's style 812 arresters, connected up with relays and batteries, formed a closed circuit. High static discharges were allowed to enter the lines and the lightning arresters showed this high voltage current going to "ground," rather than enter the relays. The current used in this demonstration was about 25,000 volts, and the current used on the relays was that of three dry batteries; the lightning arresters took the high voltage discharges very successfully and without interfering with the operation of the relays or the currents supplying same. Mr. Vogel stated that probably 50,000 of these arresters have been in use during the last two years, and that so far as he knows no telegraph or signal instruments have been injured or burned out on any circuit where these arresters have been in use.

The Sandwich Electric Company, of Sandwich, Ill., was represented by Mr. H. O. Hugh, E. C. Hennis and Louis Casper. Their exhibit consisted of an improved system in telegraphy, in addition to the various types of their well known telegraphphone. The new telegraph arrangement was set up for operation in a manner that showed clearly the method of operation and the practicability of the system. The chief function of the system is obtaining an additional Morse circuit from a way wire. Any number of intermediate way stations may be operated on this system; at the same time a through circuit between the terminals may be derived. There is no artificial line or other complications inherent to duplex systems. The telegraphphone was shown to operate upon this circuit simultaneously. This system is a radical departure from the ordinary telegraph system and considerable interest was manifested in the same by the visiting superintendents. Detailed information will be gladly furnished to interested parties regarding this apparatus

which is designated as the "Rughplex," when such parties have requirements for additional telegraph facilities without the necessity of stringing more circuits. This device has been tried in practical operation and extremely satisfactory results were obtained.

The Western Electric Company, of Chicago and New York, exhibited a line of telephone and telegraph apparatus. The apparatus used for compositing telegraph lines consisting of wall and portable station sets and the necessary condensers, resistances and terminal differentiators for the equipment of intermediate and terminal telegraph stations were on view. A full line of standard Western Union type telegraph apparatus, simple and quadruplex circuits, was also displayed. The company was represented by W. E. Harkness.

The United States Electric Company, with office at 95 William Street, New York City, gave a very complete exhibition of the Gill Selector device showing its application in actual operation. This device by its combination worked on the regular telegraph circuit, throws into the circuit a continuous ringing bell, thereby notifying the operator that he is wanted on that circuit. The device is called a selector because any number of instruments can be placed on the circuit, each having a numerical combination of its own, and by the working of its particular combination on the Morse key at the calling office, any office on the circuit may be called and the bell will ring continuously in that and in no other office on the circuit. In connection with the selector, Mr. Gill has perfected an "answer-back." This ingenious little arrangement repeats back to the calling office the number of the office called, at the same time throwing into circuit a continuous ringing bell. The calling office knows to a certainty that its signal has been received

and that the bell is ringing. Models of the semaphore device were also shown. This arrangement enables the despatcher to throw a semaphore, at any place where a semaphore is installed. The semaphores are equipped with the "answer-back," repeating back to the sending office the number of the semaphore under operation and thus insuring the operator of the fact of its proper execution. All of these devices operate on the already existing telegraph line.

These selective calling devices are of great economic value, and especially useful in connection with the operating departments of railroads in various forms of application. By the use of the Gill Selector the following are a few of the advantages insured: First, a great saving in time of employees now used in calling operator; second, a great increase in the capacity of the wire for doing business due to saving of time now used in calling operator; third, for the train despatcher a most sure and speedy transmission of train orders and a minimum of lay-outs; fourth, this device provides a means for calling an operator in an emergency, at night or when he is off duty, when a wreck or accident is imminent, for a bell can be placed in his room at his home and by its ringing the necessity of his immediate presence at his instrument will be made known to him. The representatives, at the Atlantic City Convention, were Mr. Edwin R. Gill, the inventor; Mr. Howard E. Merrell, general manager; Mr. Harrison Osborne, secretary, and Mr. W. H. Merrell, installation chief.

Mr. Richard D. Brixey, of New York, a son of W. R. Brixey, the well-known manufacturer of aerial, underground and submarine cables, and of the famous "Kerite" tape, was an interested attendant at the convention. He was elected an associate member of the association and says

that in future he will attend "all the shows." He has an affable manner, made acquaintances readily and appeared to be exceedingly well received by all the delegates present.

Mr. John J. Ghegan, of New York, president and general manager of J. H. Bunnell and Company, Inc., than which there is no better or more favorably known manufacturing concern of telegraphic supplies, was also among those present. He had a hand shake for all, for no man has a wider acquaintance among the fraternity than he, and the opportunity afforded by the convention was an excellent one for a cordial renewal of "friendly relations." He did not forget to bring along with him a little memento for each of the members. This consisted of a decidedly natty little "wallet" of pigskin, each being stamped with the name of the recipient. Of course the wives and daughters of the members were equally well remembered, only that the pocketbooks for the ladies were different in design and the names omitted, more in keeping with feminine requirements and dignity. Mrs. and Miss Ghegan accompanied Mr. Ghegan.

Mr. A. P. Eckert, of the Safety Insulated Wire and Cable Company, an associate member, was also present with his wife. Mr. Eckert is always an interested attendant at these yearly conventions, no matter where held.

Mr. John Langan, who represented the Okonite Company of New York, whose wires and tapes, Okonite and Mansen, and Candee weatherproof wires, are recognized as standard products, was inducted into associate membership and received a fine reception from those present.



TRADE MARK.
REG. U. S. PATENT OFFICE.

OKONITE

WIRES AND CABLES

Both overhead and underground are carrying without interruption electric currents for light, power and sound. Long life and absolute reliability are qualities that have made OKONITE everywhere recognized as

"The Standard Signal Wire"

As General Western Distributors we carry a complete Chicago stock; also a full line of

**D. & W. Enclosed Fuses
and Safety Devices, and
Construction Material for
All Classes of Work**

Central Electric Company

ELECTRICAL SUPPLIES

264-266-268-270 FIFTH AVE.

CHICAGO

ASSOCIATION
OF
Railway Telegraph Superintendents

PROCEEDINGS
OF THE
Annual Meeting Held at Montreal

JUNE 24th, 25th and 26th, 1908.

CONSTITUTION, BY-LAWS, LIST OF MEMBERS, ETC.

Press of
J. H. Yewdale & Sons Co., Milwaukee, Wis.
1908

THE ASSOCIATION
OF
Railway Telegraph Superintendents

Organized in Chicago, Nov. 20th, 1882.

CONSTITUTION AND BY-LAWS

387
107

1127

Recd

PAST PRESIDENTS

W. K. Morley.....	1882
W. K. Morley.....	1883
C. Selden	1884
C. W. Hammond.....	1885
A. R. Swift.....	1886
Geo. L. Lang.....	1887
Geo. C. Kinsman.....	1888
C. A. Darlton.....	1889
G. T. Williams.....	1890
C. S. Jones.....	1891
L. H. Korty.....	1892
U. J. Fry.....	1893
O. C. Greene.....	1894
M. B. Leonard.....	1895
G. M. Dugan.....	1896
J. W. Lattig.....	1897
W. W. Ryder.....	1898
L. B. Foley.....	1899
W. F. Williams.....	1900
C. F. Annett.....	1901
J. H. Jacoby.....	1902
C. S. Rhoads.....	1903
H. C. Hope.....	1904
E. E. Torrey.....	1905
E. A. Chenery.....	1906
E. P. Griffith.....	1907

OFFICERS

1908-9

PRESIDENT.

W. J. Camp.....C. P. Ry.....Montreal.

VICE-PRESIDENT.

G. W. Dailey.....C. & N. W. Ry.....Chicago, Ill.

SECRETARY AND TREASURER.

P. W. Drew.....W. C. Ry.....Chicago, Ill.

COMMITTEES

ARRANGEMENTS.

E. H. Millington.....Mich. Central.....Detroit, Mich.
Wm. MarshallC. P. R.....Toronto, Ont.
G. C. Kinsman.....WabashDecatur, Ill.
W. W. Ashald.....G. T.Montreal.
Wm. KlineL. S. & M. S.....Toledo, O.

LADIES' RECEPTION.

Mrs. E. H. Millington, Mrs. G. C. Kinsman,
Mrs. Wm. Marshall, Mrs. Wm. Kline,
Mrs. W. W. Ashald.

TOPICS.

J. L. Davis.....C. & E. I. Ry.....Chicago, Ill.
E. Parsons.....Ill Cent. Ry.....Chicago, Ill.
Percy HewettSunset Lines.....Houston, Tex.

HIGH TENSION WIRE CROSSINGS.

G. A. Cellar.....Pa. Lines W. of P....Pittsburgh, Pa.
G. H. Groce.....Ill. Central.....Chicago, Ill.
G. W. Dailey.....C. & N. W.....Chicago, Ill.
E. H. Millington.....M. C.Detroit.
Chas. Selden.....B. & O.....Baltimore.

SUB-COMMITTEES ON QUARTERLY MEETINGS.

Eastern.

C. Selden, L. B. Foley, A. B. Taylor.

Western.

E. A. Chenery, J. L. Davis, C. S. Rhoads.

CONSTITUTION

ARTICLE I.

Title.

The organization shall be known as "The Association of Railway Telegraph Superintendents.

ARTICLE II.

Object.

The object of this Association shall be: "The Improvement of the Telegraph Service," and the promotion and advancement in general of the interests of the telegraph department of railroads.

ARTICLE III.

Who May be Members.

Sec. 1. The membership of the Association shall be of three classes: Active, Associate and Honorary.

Sec. 2. Who may be Active Members:

Anyone connected in an official capacity with the telegraph, telephone, electric light, electric power, or electric signal department of any railroad, may become an Active Member of this Association, by subscribing to the Constitution and paying into the Treasury \$5.00 per annum and receiving a majority vote of the members present.

Sec. 3. Who may be Associate Members.

Anyone connected with a telegraph or telephone supply house or publication may become an Associate Member, subject to receiving a majority vote of the members present and paying into the Treasury \$5.00 per annum.

Associate Members shall be entitled to all the rights and privileges of Active Members, except that they shall not be allowed to vote.

Sec. 4. Who may be Honorary Members:

Men prominent in Railway Telegraph or Telephone circles, and those who have by furnishing papers and otherwise contributed to the success of the Association, and any Active Member, who is in good standing as to payment of dues, leaving the service of railroad companies or of the departments mentioned in Sec. 2, may become an Honorary Member upon receiving a majority vote of members present. Honorary members shall be entitled to all the rights and privileges of Active Members except that they shall not be allowed to vote.

ARTICLE IV.

Officers.

The officers of this Association shall be elected by ballot, and shall hold office for one year, or until their successors are chosen. They shall consist of a President, Vice-President, Secretary and Treasurer; the last two offices may be filled by one person. The officers of this Association shall constitute an Executive Committee.

ARTICLE V.

Duties of Officers.

President—The President shall preside at all meetings of the Association, and perform such other duties as are generally performed by that officer.

Vice-President—The Vice-President shall preside in the absence of the President, and when so acting shall be governed by the rules prescribed for that officer.

Secretary—The Secretary shall keep correct minutes of each meeting, and cause the same to be printed immediately after adjournment, and send to each member two copies of the same. He shall also notify the members, by circular,

of the time and place of each meeting, and perform such other duties as may be required by the Executive Committee.

Treasurer—The Treasurer shall collect all moneys due the Association, giving his receipt therefor, pay all bills contracted for by it, upon the approval of the Executive Committee, and at each annual meeting render a detailed statement of the receipts and expenditures of the previous year, which statement shall be printed with the proceedings of the meeting at which it is presented. In order to meet expenses in excess of the receipts from annual dues, he shall levy a pro rata assessment upon the members of this Association.

ARTICLE VI.

Vacancies.

In case of a vacancy in any office, it shall be filled for the remainder of the year by the Executive Committee.

ARTICLE VII.

Seven members shall constitute a quorum at any meeting.

Amendments to the Constitution.

This constitution shall be changed only by an amendment offered in writing at a regular meeting, one month's notice having been given to each member by the Executive Committee, and can only be adopted by an affirmative vote of two-thirds of the members present.

BY-LAWS.

1. The Executive Committee is authorized to declare applicants acting members previous to the annual meeting.

2. The annual meeting of this Association shall be held at such time and place as shall be designated by the majority vote of members at a previous meeting.

3. Special meeting may be held upon the call of the Executive Committee, when requested by seven or more members.

4. Any member who is in arrears in payment of dues ninety days after the annual meeting shall be considered suspended, and should dues not be paid on or before the succeeding annual meeting, his name shall be dropped from the roll of membership.

At all meetings the following shall be the order of business:

1. Election of New Members.
2. Reading the Minutes of Regular and Special Meetings.
3. Report of Treasurer.
4. Reports of Standing Committees.
5. Reports of Special Committees.
6. Election of Officers.
7. Miscellaneous Business.
8. Adjournment.

LIST OF ACTIVE MEMBERS

Name.	Railroad.	Address.
C. P. Adams.....	Southern	Washington, D. C.
W. W. Ashald.....	G. T.	Montreal, Que.
B. B. Baughman.....	W. & L. E.....	Canton, O.
F. E. Bentley.....	T. R. R. Assn.....	St. Louis, Mo.
E. R. Bonnell.....	C. C. C. & St. L.....	Indianapolis, Ind.
George Boyce.....	C. St. P. M. & O.....	St. Paul, Minn.
F. G. Boyer.....	N. T. Co.....	Oil City, Pa.
F. M. Brown.....	P. & L. E.....	Pittsburgh, Pa.
J. C. Browne.....	St. L. I. M. & S.....	Little Rock, Ark.
S. K. Bullard.....	M. K. & I.....	Sedalia, Mo.
W. J. Camp.....	Can. Pacific.....	Montreal, Que.
G. A. Cellar.....	Pa. Lines W. of P....	Pittsburgh, Pa.
E. A. Chenery.....	Mo. Pac.	St. Louis, Mo.
J. P. Church.....	Wabash	Decatur, Ill.
W. P. Cline.....	A. C. Line.....	Wilmington, N. C.
W. L. Connelly.....	C. I. & S.....	Gibson, Ind.
G. W. Dalley.....	C. & N. W.....	Chicago, Ill.
J. L. Davis.....	C. & E. I.....	Chicago, Ill.
E. W. Day.....	B. & O.....	Baltimore, Md.
E. E. Dildine.....	Nor. Pac.....	St. Paul, Minn.
G. A. Dornberg.....	Pa. Lines W of P....	Pittsburgh, Pa.
P. W. Drew.....	Wis. Central.....	Chicago, Ill.
I. T. Dyer.....	S. P. L. A. & S. L....	Los Angeles, Cal.
J. B. Fisher.....	Penna	Philadelphia, Pa.
L. B. Foley.....	D. L. & W.....	New York, N. Y.
A. S. Foote.....	Sunset Lines.....	Houston, Tex.
S. A. D. Forristall....	B. & M.....	Boston, Mass.
B. F. Forbes.....	O. S. L.....	Salt Lake City, Utah
U. J. Fry.....	C. M. & St. P.....	Milwaukee, Wis.
C. H. Gaunt.....	A. T. & S. F.....	Topeka, Kas.
O. C. Greene.....	Nor. Pac.	St. Paul, Minn.
E. P. Griffith.....	Erie	Jersey City, N. J.

Name.	Railroad.	Address.
G. H. Groce.....	Ill. Central.....	Chicago, Ill.
J. G. Hampton.....	No. Amn. T. Co.....	Deseronto, Ont.
A. Hatton	C. P.	Winnipeg, Man.
J. L. Henritzky.....	C. & S.....	Denver Col.
Percy Hewett	Sunset Lines.....	Houston, Tex.
H. C. Hope.....	C. St. P. M. & O.....	St. Paul, Minn.
J. G. Jennings.....	C. R. I. & P.....	Chicago, Ill.
F. T. Jennings.....	C. P.	Sudburg, Ont.
W. M. Johnson, Jr.....	B. & L. E.....	Greenville, Pa.
L. M. Jones.....	A. T. & S. F.....	Topeka, Kas.
G. C. Kinsman.....	Wabash	Decatur, Ill.
V. T. Kissinger.....	B. & M. R.....	Lincoln, Neb.
Wm. Kline	L. S. & M. S.....	Toledo, O.
E. A. Kilppel.....	O. R. & N.....	Portland, Ore.
C. L. Lathrop.....	P. S. & N.....	Angelica, N. Y.
C. M. Lewis.....	P. & R.....	Reading, Pa.
E. J. Little.....	Gt. Nor.	St. Paul, Minn.
R. L. Logan.....	K. C. Sou.....	Kansas City, Mo.
E. E. McClintock.....	C. & W.....	Denver, Colo.
G. B. McCoy.....	Y. & M. V.....	Greenville, Miss.
W. P. McFarlane.....	C. & N. W.....	Omaha, Neb.
M. Magiff	Cent. Vt.	St. Albans, Vt.
M. W. Maguire.....	N. & S.....	Norfolk, Va.
W. Marshall	C. P.	Toronto, Ont.
W. S. Melton.....	Q. & C.....	Lexington, Ky.
R. W. Mitchener.....	N. Y. C. & St. L.....	Cleveland, O.
E. H. Millington.....	M. C.	Detroit, Mich.
J. L. Orbison.....	C. H. & D.....	Cincinnati, O.
C. A. Parker.....	D. N. W. & P.....	Denver, Colo.
E. Parsons.....	Ill. Cent.	Chicago, Ill.
E. A. Patterson.....	C. M. & St. P.....	Milwaukee, Wis.

Name.	Railroad.	Address.
C. P. Phelps.....	L. & N.....	Louisville, Ky.
W. H. Potter.....	Southern	Washington, D. C.
F. S. Rawlings.....	Sou. Pac.	San Francisco, Cal.
Geo. Reith	Virginia	Norfolk, Va.
C. S. Rhoads.....	C. C. C. & St. L.....	Indianapolis, Ind.
Thos. Rodger.....	G. T.	Montreal, Que.
Geo. Rooke	C. P.	Montreal, Que.
W. W. Ryder.....	C. B. & Q.....	Chicago, Ill.
C. Selden	B. & O.....	Baltimore, Md.
J. B. Sheldon.....	Union Pac.	Omaha, Neb.
F. G. Sherman.....	C. R. R. of N. J.....	New York.
N. E. Smith.....	N. Y., N. H. & H.....	New Haven, Conn.
F. W. Smith.....	B. & L. E.....	Greenville, Pa.
P. W. Snider.....	C. P.	St. John, N. B.
F. S. Spafard.....	C. R. I. & P.....	Chicago, Ill.
J. S. Stevens.....	C. & O.....	Richmond, Va.
A. B. Taylor.....	N. Y. C. & H. R.....	New York.
H. D. Teed.....	St. L. & S. F.....	St. Louis, Mo.
G. C. Todd.....	N. Y. C. & St. L.....	Cleveland, O.
E. E. Torrey.....	M. & O.....	Jackson, Tenn.
H. A. Tuttle.....	M. St. P. & S. S.....	Minneapolis, Minn.
S. L. Van Akin.....	N. Y. C. & H. R.....	Syracuse, N. Y.
F. H. Van Etten.....	Sou. Ind	Chicago, Ill.
J. M. Walker.....	D. & R. G.....	Denver, Colo.
W. C. Walstrum.....	N. & W.....	Roanoke, Va.
B. Weeks.....	Ill. Cent.	Memphis, Tenn.
L. S. Wells.....	Long Island	Long Island City.
W. F. Williams.....	S. A. Line.....	Portsmouth, Va.
R. N. Young.....	C. P.	Winnipeg, Man.

ASSOCIATE MEMBERS

R. D. Brixie.....	New York.
C. E. Brown.....	Chicago.
A. N. Bullens.....	Boston
H. P. Clausen.....	Chicago.
A. B. Conover.....	Chicago.
H. D. Crouch.....	Montreal, Que.
W. F. Crowell.....	New York.
Geo. M. Dodge.....	Valparaiso, Ind.
A. P. Eckert.....	New York.
F. F. Fowle.....	Chicago.
J. J. Ghegan.....	New York.
Edwin R. Gill.....	New York.
L. C. Hall.....	Newark, N. J.
W. E. Harkness.....	New York.
T. S. Hemingway.....	Buffalo, N. Y.
Alex Henderson	Boston, Mass.
W. E. Hinmon.....	Dayton, O.
F. C. Hirsch.....	Montreal.
S. Johnson	New York.
B. A. Kaiser.....	New York.
J. C. Kelsey	Chicago.
John Langan	New York.
M. E. Launbranch.....	New York.
E. C. Lewis.....	Chicago.
H. E. Merrill.....	New York.
P. W. Miller.....	New York.
Jay G. Mitchell.....	Cleveland, O.
Harrison Osborn	New York.
F. H. Reed.....	New York.
H. O. Rugb.....	Sandwich, Ill.
B. H. Shepard	Syracuse, N. Y.
H. C. Slein	Rochester, N. Y.
Henry M. Sperry.....	New York.
E. W. Vogel.....	Chicago.
J. V. Watson.....	Chicago.
Archibald Wray	Chicago.
G. F. Wiley.....	Philadelphia.

HONORARY MEMBERS

Thos. **A.** Edison.
 John **B.** Taylor.
 T. D. **L**ockwood.
 Ralph **W.** Pope.
 J. C. **Ba**rcley.
 J. B. **St**ewart.
 A. J. **Ea**rling.
 C. H. **Br**istol.
 C. E. **Fr**ee-man.
 Wm. **Ma**ver, Jr.
 Geo. **C.** Maynard.
 W. K. **M**orley.
 F. P. **Val**entine.
 W. E. **Gi**lmore.
 H. V. **Mi**ller.
 H. F. **H**oughton.
 J. F. **Wa**llick.
 J. **Le**vin.
 J. R. **Ter**hume.
 James **K**ent.
 G. F. **We**ldman.
 J. H. **Ja**coby.
 G. M. **Du**gan.
 W. J. **H**olton.
 Wendell **Ba**ker.
 L. H. **K**orty.

R. C. Clowry.
 W. C. Brown.
 Geo. W. Stevens.
 Marvin Hughitt.
 W. M. Greene.
 T. P. Cook.
 F. S. Gannon.
 Geo. T. Williams.
 Belvidere Brooks.
 I. N. Miller.
 T. R. Taltavall.
 J. W. Fortune.
 W. J. Murphy.
 C. D. Gorham.
 Charles McLaughlin.
 J. B. Taltavall.
 E. A. Smith.
 C. G. Sholes.
 A. R. Swift.
 E. Borden.
 F. E. Clary.
 C. A. Darlton.
 C. F. Annett.
 Geo. L. Lang.
 F. A. C. Ferguson.
 H. C. Sprague

Association of Railway Telegraph Superintendents.

Twenty-Seventh Annual Convention.

MONTREAL, CANADA.

June 24th, 25th, 26th, 1908.

The twenty-seventh Annual Convention of the Association of Railway Telegraph Superintendents, was held in the Ladies' Ordinary of the Windsor Hotel, Montreal, Quebec, on Wednesday, Thursday and Friday, June 24th, 25th and 26th, 1908.

ATTENDANCE

ACTIVE MEMBERS.

W. W. Ashald and wife, Grand Trunk Ry., Montreal.
B. B. Baughman, W. & L. E., Canton, O.
F. M. Brown, P. & L. E., Pittsburgh, Pa.
F. G. Boyer and wife, N. T. Co., Oil City, Pa.
Geo. Boyce, C. St. P. M. & O., St. Paul, Minn.
J. P. Church, Wabash, Decatur, Ill.
G. A. Cellar, Pa. Lines W. of P., Pittsburgh, Pa.
W. P. Cline, wife and daughter, A. C. Line, Wilmington, N. C.
E. A. Chenery and son, Mo. Pac., St. Louis, Mo.
W. J. Camp and wife, C. P. R., Montreal.
G. A. Dornberg, Pa. Lines W. of P., Pittsburgh, Pa.
J. T. Dyer, S. P. L. A. & S. L., Los Angeles, Cal.
E. E. Dildine, Nor. Pac., St. Paul, Minn.
G. W. Dailey, C. & N. W., Chicago.
John L. Davis, wife and son, C. & E. Ills., Chicago.
P. W. Drew and wife, Wis. Cent., Chicago.
J. A. D. Forristall, B. & M., Boston.
L. B. Foley and wife, D. L. & W., New York.
B. F. Frobes and wife, O. S. L., Salt Lake City.
J. B. Fisher, Penna. R. R., Philadelphia.
E. P. Griffith, wife and daughter, Erie R. R., Jersey City, N. J.

- A. Halton**, C. P. R., Winnipeg.
J. G. Hampton, No. Amn. Tel Co., Deseronto, Ont.
W. M. Johnson, Jr., B. & L. E., Greenville, Pa.
F. T. Jennings, C. P. R., Sudburg, Ont.
V. T. Kissinger and wife, C. B. & Q., Lincoln, Neb.
Wm. Kline, L. S. & M. S., Toledo, O.
C. L. Lathrop and wife, P. S. & N., Angelica, N. Y.
C. M. Lewis, P. & R., Reading, Pa.
R. L. Logan and wife, K. C. Sou., Kansas City, Mo.
W. Marshal, C. P. R., Toronto, Ont.
E. H. Millington, M. C. R. R., Detroit, Mich.
M. Magiff and wife, Cent. Vt., St. Albans, Vt.
W. S. Melton and son, C. N. O. & T. P., Lexington, Ky.
E. E. McClintock, C. & W., Denver, Colo.
W. P. McFarlane, C. & N. W., Omaha, Neb.
Thos. Rodger and wife, G. T., Montreal.
Geo. T. Rooke, C. P. R., Montreal.
C. S. Rhoads, C. C. C. & St. L., Indianapolis, Ind.
W. W. Ryder and wife, C. B. & Q., Chicago.
Fred W. Smith, B. & L. E., Greenville, Pa.
Chas. Selden, B. & O., Baltimore.
J. S. Stevens, C. & O., Richmond, Va.
P. W. Snider and wife, C. P. R., St. John, N. B.
John B. Sheldon, Union Pac., Omaha, Neb.
N. E. Smith, N. Y. N. H. & H., New Haven, Conn.
F. G. Sherman and wife, C. R. R. of N. J., New York.
H. D. Teed, St. L. & S. F., St. Louis.
G. C. Todd and wife, N. Y. C. & St. L., Cleveland, O.
A. B. Taylor, wife and daughter, N. Y. C. & H. R., New York.
S. L. Van Akin and wife, N. Y. C. & H. R., Syracuse, N. Y.
F. H. Van Etten, Sou. Ind., Chicago.
W. C. Walstrum and daughter, N. & W., Roanoke, Va.
W. F. Williams, wife and daughters, S. A. Line, Portsmouth, Va.
R. N. Young, C. P. R., Winnepeg, Man.

ASSOCIATE MEMBERS.

- R. D. Brixey**, New York.
A. N. Bullens, Boston.
H. D. Crouch, Montreal.
W. F. Crowell, New York.

G. M. Dodge and son, Valparaiso, Ind.
 A. P. Eckert and wife, New York.
 E. R. Gill, New York.
 John J. Ghegan, wife and daughter, New York.
 L. C. Hall, Newark, N. J.
 W. E. Harkness, New York.
 T. S. Hemengway, Buffalo, N. Y.
 W. E. Hinmon, Dayton, O.
 F. C. Hirsch, Montreal:
 B. A. Kaiser, New York.
 J. C. Kelsey and wife, Chicago.
 M. E. Launbranch, New York.
 E. C. Lewis and wife, Chicago.
 H. E. Merrill and wife, New York.
 P. W. Miller, New York.
 Franklin H. Reed, New York.
 H. O. Rugh, Sandwich, Ill.
 H. C. Slemin, Rochester, N. Y.
 Bert H. Shepard, Syracuse, N. Y.
 E. W. Vogel and wife, Chicago.
 J. V. Watson, Chicago.
 Archibald Wray, Chicago.
 Geo. F. Willey, Philadelphia, Pa.

HONORARY MEMBERS AND VISITORS.

James Kent and wife, Montreal.
 Wm. Maver, Jr., wife and daughter, New York.
 John B. Taltavall, wife and daughter, New York.
 I. McMichael and wife, Toronto, Ont.
 F. E. Clary, New Haven, Conn.
 Edgar A. Smith, Boston.
 N. R. Fill, St. Louis, Mo.
 L. S. Humes and wife, Montreal.
 Wm. W. Mulford, New York.
 C. L. Howk, Chicago.
 G. W. Swan, New York.
 R. R. Newell, New York.
 S. R. Wright and wife, Rochester, N. Y.
 G. E. Lawlor, Pittsburgh, Pa.
 A. G. Francis, wife and sons, Chicago.

Chas. E. Hague and wife, Rochester, N. Y .
J. O. Oliver, Philadelphia.
H. C. Stephan, Buffalo, N. Y.
W. T. Saunders, Chicago.
L. B. McFarlane and wife, Montreal.
S. B. Kramer, Montreal.
L. H. Merrill, Minneapolis, Minn.
J. H. Kenahan, Montreal.
Misses E. N. and Jane Neeley, Portsmouth, Va.
Mrs. A. V. Cornish, Lincoln, Neb.
Gladys and Eric Camp, Montreal.
A. C. Lindemuth and wife, Chicago.
Val. V. Mintun, Kansas City, Mo.
James A. Rugh, Sandwich, Ill.
Misses May and Margaret Kent, Montreal.
John F. Richardson and wife, Montreal.

FIRST DAY—MORNING SESSION.

(Wednesday, June 24th, 1908).

The Convention was called to order at 10:15 A. M., the President, Mr. E. P. Griffith, Erie Railway, Jersey City, N. J., being in the chair.

In opening the proceedings the President said:

Gentlemen, as President of this Association it is very pleasant indeed for me to see so many of you here in attendance at our twenty-seventh annual convention. This indicates to me that we, like the City in which we are holding this Convention, have made great strides in advance since the time we met here before.

It is my pleasure to introduce to you Alderman George W. Sadler, representing the Corporation of the City of Montreal, and His Worship the Mayor, who has been unavoidably detained and who has not found it possible to be with us at this, our opening session.

I have much pleasure in introducing to you Alderman George W. Sadler.

Alderman Sadler: Mr. President, ladies and gentlemen, of the American Association of Telegraph Superintendents, I hope you will excuse me if I appear to be rather slow i getting out the name of your Association. I can assure yo that it is because I wish to be very particular indeed.

In my capacity as an Alderman, I have met with so many telegraphers—although I know you do not look like the kind of telegraphers I refer to—still, I want to be sure that I get your name right.

My duty this morning is a very pleasant one, indeed, and one of my first remarks must be an apology for His Worship, Mayor Patette, who is absent in Europe. I know he would have been only too delighted to welcome you on behalf of the Citizens and Corporation of the great City of Montreal.

I have also to apologize for our acting Mayor, upon whom the duty of welcoming you should devolve in the absence of our worthy Chief Magistrate. Today, as some of you probably know, is the feast of St. John Baptiste, the patron Saint of our French Canadian citizens, and, in the hurry and excitement of his efforts to honor his patron saint, our Worthy Acting Mayor may have forgotten the American Association of Railway Telegraph Superintendents.

In the absence of these two very worthy and distinguished gentlemen it becomes my pleasure to welcome you to our city on behalf of the Corporation and Citizens of Montreal.

I understand that it is some years since you have held a meeting with us. That being the case, I know you will find a great deal of difference in the City of Montreal, as compared with what it was when you were here some years ago.

Although it looks a bit cloudy today, I trust that the sun will shine bright while you are here, and that your stay will be one which will be long remembered as the most successful meeting in the history of your Association.

I trust that you will make yourself perfectly at home in our city, and that you will enjoy every minute of the time you spend with us.

So far as the technical side of your meeting is concerned, I do not need to say anything. You are an old and important Association, and I know that whatever subjects are brought before you for consideration will be thoroughly dealt with, and that the results of your deliberations will reflect credit upon yourselves, both as an Association and individually.

Once again I bid you a hearty welcome to our city, and hope that when you come to leave us you will do so feeling benefited by your short stay with us, and, with a determination to come and see us again in the very near future.

President Griffith: I am sure we will feel grateful to Alderman Sadler for his kind words of welcome to us this morning, and I am sure that each member of this Association present, appreciates fully what he has said.

We have with us also today a gentleman, who, perhaps, was more instrumental than any other individual in bringing this Association to Montreal this year, and in making the arrangements for our care and entertainment.

I have much pleasure in introducing to you Mr. Charles Chaput, Vice-President of the Business Men's League of Montreal.

Mr. Chaput: Mr. President, ladies and gentlemen, in the absence of the President of the Montreal Business Men's League, Mr. Henry Myles, it is my pleasant duty to say a

few words of welcome to you, as Vice-President of that organization.

In the name of the Montreal Business Men's League, I have much pleasure in extending to you a hearty welcome to the City of Montreal, and sincerely hope that your stay amongst us will be a most pleasant and enjoyable one.

The Montreal Business Men's League, since its inception has always taken a deep interest in all conventions coming to Montreal. I may say that we have been instrumental in bringing many meetings to our city, and every year will add to this number.

We hope that your meeting here will be a most profitable one, and, when you have transacted your business and taken in some of the sights of our fair city, we will say to you "Aurevoir, come again."

I am very sorry to hear that Mrs. Griffith, the wife of your worthy President is not here today. Miss Griffith, however, is here in her stead, and I am sure is fully capable of filling her place with honor and dignity.

I cannot allow this occasion to pass without offering Miss Griffith a few flowers.

On behalf of the Association, Mr. Chaput then presented Miss Griffith with a magnificent bouquet of American Beauty roses.

President Griffith: Mr. Chaput, I regret that Mrs. Griffith is so indisposed as to be unable to be present this morning at the opening of this meeting. I wish to thank you very kindly on behalf of the Association for your words of welcome to us here, and I also wish to thank you on behalf of Miss Griffith for your kind words, and the magnificent bouquet with which you have presented her.

Mr. Sadler, and Mr. Chaput, in your official capacities, I wish to thank you on behalf of this Association for the

kind greetings you have expressed towards us this morning. I know we all feel that we shall have a very enjoyable and profitable time during our stay here.

This Convention is not a Convention of the kind which has *been* recently agitating our cousins on the other side of the *imaginary* line. Although we have a good deal of wire *pulling*, I am pleased to say that it is not of the kind which is usu*ally* done at political meetings.

Many of us have been to your city before, and the recollection *of* the pleasant times we had then is still fresh in our minds. We are glad to see so many more on this occasion.

As *I* said before, we have grown a great deal since our last *meeting* here, and we hope that you have grown in proportion.

Again I wish to thank you very kindly.

Unless there is some objection to it, I think it would be a good *plan* for us to take a recess for five or ten minutes, in order to permit the ladies who do not wish to remain with us, to go and see the shops.

RECESS.

Upon the Convention re-opening, the Secretary said:

The first order of business, according to our by-laws, is the reception of new members. The following have applied for membership in our Association:

NEW MEMBERS

ACTIVE.

H. D. Teed.....	St. L. & S. F. R. R.....	St. Louis, Mo.
R. W. Mitchener.....	N. Y. C. & St. L.....	Cleveland, O.
W. L. Connelly.....	C. I. & I. R. R.....	Gibson, Ind.
F. G. Boyer.....	Natl. Transit Co.....	Oil City, Pa.
F. M. Brown.....	P. & L. E.....	Pittsburgh, Pa.

E. E. Dildine.....	Nor. Pac. Ry.....	St. Paul, Minn.
J. B. Sheldon.....	Union Pac. Ry.....	Omaha, Neb.
B. B. Baughman.....	W. & L. E.....	Canton, O.
F. T. Jennings.....	C. P. R.....	Sudburg, Ont.
G. C. Todd.....	N. Y. C. & St. L.....	Cleveland, O.
R. N. Young.....	C. P. R.....	Winnipeg, Man.
F. W. Smith.....	B. & L. E.....	Greenville, Pa.
Geo. Reith	Va. Ry.	Norfolk, Va.
Geo. T. Rooke.....	C. P. R.....	Montreal, Que.
Thos. Rodger	Grand Trunk.....	Montreal, Que.
W. Marshall	C. P. R.....	Toronto, Ont.
W. M. Johnson, Jr....	B. & L. E.....	Greenville, Pa.
J. P. Church.....	Wabash Ry	Decatur, Ill.
M. W. Maguire.....	N. & S. Ry.....	Norfolk, Va.
E. R. Bonnell.....	C. C. C. & St. L.....	Indianapolis, Ind.
J. G. Hampton.....	No. Amer. Tel. Co....	Deseronto, Ont.
Geo. Boyce	C. St. P. M. & O.....	St. Paul, Minn.
F. S. Rawlings.....	Sou. Pac. Ry.....	San Francisco.
A. Hatton	C. P. R.....	Winnipeg, Man.
P. W. Snider.....	C. P. R.....	St. Johns, N. B.

Secretary Drew: I would move that these gentlemen be elected members of the Association.

This motion being duly seconded and put to the Meeting, was carried.

We have the following names of gentlemen who are practically retired from the Telegraph Service. I think it would be a good idea to place them on the Honorary List.

I would therefore move that the following gentlemen be put on the Roll of Honorary Members of this Association:

HONORARY.

Wendell Baker	New York.
L. H. Korty.....	Omaha, Neb.
F. A. C. Ferguson.....	Vicksburg, Miss.
H. C. Sprague.....	St. Louis, Mo.

The motion being duly seconded, was carried.

The President: I understand that we have a long list of Associate Members, and would ask the Secretary to read it.

The Secretary read the following list of applicants for membership as Associate members:

ASSOCIATE.

M. E. La	unbranch.....	West. Elec. Co.....	New York.
W. E. H	arkness.....	West. Elec. Co.....	New York.
A. B. C	onover.....	J. A. Roebling's Sons	Chicago.
F. H. R	eed.....	Ann. Tel. Journal....	New York.
B. H. S	hepard.....	Cent. N. Y. Tel. Co...	Syracue, N. Y.
H. D. C	rouch.....	Nor. Elec. & Mfg. Co..	Montreal, Que.
W. F. C	rowell.....	N. Y. Tel. Co.....	New York.
W. E. H	inmon.....	Egry. Reg. Co.....	Dayton, O.
H. C. S	lamin.....	Stromberg-Carlson Co.	Rochester, N. Y.
Archibald W	ray	Kellog Switch Bd. Co.	Chicago.
L. C. H	all.....	N. Y. & N. J. Tel. Co..	Newark, N. J.
A. N. B	ullens.....	N. E. Tel. and Tel. Co.	Boston, Mass.
G. F. W	iley.....	Bell Tel. Co. of Pa....	Philadelphia.
T. S. H	emingway.....	L. M. Ericsson Tel. Co.	Buffalo, N. Y.
E. C. L	ewis.....	Stromberg-Carlson Co..	Chicago.
P. W. M	iller.....	W. R. Brixey Co.....	New York.
F. C. H	irsch.....	Tel. Sys. of Can.....	Montreal.
J. V. W	atson.....	Watson Ins. Wire Co..	Chicago.

Mr. Williams: I would move that the gentlemen whose names have just been read by our Secretary be elected as Associate Members of the Association, under the ordinary conditions.

Which motion being duly seconded, was carried.

The President: Before proceeding with our next order of business, I wish to make a sad announcement. I have just been handed a bulletin, dated Princeton, N. J., June 24th, "Former President Grover Cleveland, died here at eight-forty, A. M., today."

Next on the order of business is the reading of the minutes of our last regular meeting.

Mr. Selden: I would move, Mr. President, that the reading of the Minutes be dispensed with, and that we proceed with the regular business before the Convention.

This motion was seconded by Mr. Chenery, and carried.

The President: Now, that we have dispensed with the reading of the Minutes we will have the report of the Treasurer.

The Treasurer then presented his report as follows:

TREASURER'S REPORT.

Ass'n. of Ry. Telegraph Superintendents, Montreal,
June 24, 1908.

RECEIPTS.

On Hand June 19, 1907.....	\$ 93.00
Dues and Fees	500.00
Minutes Sold	2.00
Advertisements	255.00
Total	<u>\$850.00</u>

DISBURSEMENTS.

Expense of Minutes of 1907 Annual Meeting.....	\$501.30
Postage and Expressage.....	19.35
Printing Circulars, Etc.....	12.25
Badges	13.10
Secretary's Salary	300.00
Cash on Hand.....	4.00
Total	<u>\$850.00</u>

Respectfully submitted.

P. W. DREW, Treasurer.

Mr. Camp: I would move that the report of the Treasurer, as read, be received and adopted.

This motion being duly seconded by Mr. Rhoads, and carried.

The President: The next item on our programme is the **report** of the standing committees. In order that the members **should** have a chance to get around a little today, as I **know** they are anxious to do, we will hear from the **Committee on Arrangements** first. Mr. Camp is Chairman of that **Committee**.

Mr. Camp: Mr. President, and Gentlemen, on behalf of the **Committee of Arrangements**, I beg to report, your circular **calling** this meeting gives the hotel rates, rates on the **Richelieu** and Ontario Navigation Company's steamers, and so **forth**. The programme for entertainment is as follows:

At **5 P. M.** today we leave the G. T. R. Station for **Lachine**. Mr. Ashald will arrange for transportation of all **who** intend going. On arrival at Lachine, we board a **steamer** of the Ottawa River Navigation Company, and shoot **the** Lachine Rapids, arriving in Montreal for dinner. The **fare** on the boats being only twenty-five cents, your **Committee** did not think it advisable to apply for a reduction.

I **understand** that a large number of those present are **members** of the Masonic craft, and as there is a regular **meeting** of one of the French lodges this evening. I have **obtained** a cordial invitation from the Worshipful Master to all **Masons** attending the Convention to join them in **Fraternal** intercourse. A number of English speaking Past **Masters** will be present to assist in examinations, and I can **assure** all a most cordial welcome, and an enjoyable evening. **Evening** dress is not necessary.

Those present who are not members of the craft are **requested** to entertain the ladies.

Tomorrow afternoon, through the kindness of the Montreal Street Railway, we will have a trolley ride. Cars will

leave from the main door of this Hotel at two o'clock sharp. As there is no siding near here, all must be ready sharp on time. Before, or during the ride, Mr. S. R. Martin will take photographs of the party. Mr. Martin, being an old Railway Telegraph Operator, I hope you will make his effort a success.

Through the courtesy of the Canadian Pacific Railway, we will be able to visit the ancient and historic City of Quebec. Trains will leave Place Viger Station at 11:30 Friday night, and returning leave Quebec at 11:30 Saturday night. All who wish to take this trip will please sign the list on the Secretary's table, stating by whom accompanied, and the number of berths required. I would like this attended to as soon as possible, so that I can arrange transportation and sleeping accommodation. We are due to arrive at Quebec at 6:30 Saturday morning, and will have breakfast at the Chateau Frontenac.

The Quebec Railway Light and Power Company very kindly agreed to furnish us with a special electric train, which will leave Quebec for the Roman Catholic Shrine of St. Anne de Beaupre, largely visited by Pilgrims from all over the Continent. When returning we will stop for a short time at Montmorency Falls, arriving at Quebec in time for lunch. Meals at the Chateau will be one dollar each.

During the afternoon all must entertain themselves, but do not forget that the train for Montreal will leave at 11:30 P. M.

Should any of the Active Members desire to return home via Winnipeg or Vancouver, Mr. Kent has arranged for a special sleeping car to leave Montreal on Sunday at 10:10 A. M., and will be pleased to arrange transportation. On account of the law, which is almost identical with that of

the United States, this can only apply to Active Members and their families, and there being only one sleeper, only a limited number of them.

The Western Union and Great Northwest Telegraph companies, and the Postal and C. P. R. telegraphs extend free telegraph privileges.

The American Telegraph and Telephone Company, and the Bell Telephone Company of Canada extend free privileges after six P. M. during the session.

In order that the ladies will know just what is to be done, at the request of Mrs. Camp, Chairman of the Ladies Committee, I have had a programme printed for their use.

Mr. Charles R. Hosmer very kindly donated an amount for car tickets, which have been supplied to the Ladies Committee, and which will probably be sufficient.

I would like to mention, before closing, that Mr. Kent has cordially seconded my efforts to make this year's session a pleasant one, and it was through him I obtained the above courtesies over the C. P. R.

Mr. Ashald, on behalf of the G. T. R., was ready to do more, but, as our work is likely to be heavy, it was thought that the entertainment above outlined would be sufficient.

I thank the members of my Committee for their warm support of all my suggestions.

On behalf of the Committee I move that this report be received and adopted, as far as practicable.

Mr. Ashald: I have much pleasure in seconding Mr. Camp's motion.

The motion being put to the meeting, was unanimously adopted.

The President: The next item on our programme is the report on the Topics Committee. Mr. Davis is Chairman of that Committee.

Mr. Davis: The work of the Topics Committee has been rather easy this year, because the members have seemed very willing to respond to the request which was made upon them. We outlined the work that we wanted done, and the members very willingly came forward and did it.

I could say a whole lot in expressing my appreciation of the hearty response that has been made to the requests of the Topics Committee, but we have not a great deal of time for that sort of thing, and, inasmuch as you have seen the programme, the only thing I need to say is that the Topics Committee extends its thanks to those gentlemen who have so very liberally and kindly responded.

The President: We have in the Secretary's File a full list of the Topics to which the Chairman of the Committee alludes, and I think we might proceed with the papers immediately.

I think it would be a good idea for us to take up the question of the telephone in railway service. Mr. W. W. Ryder, Superintendent Telegraph, Chicago, Burlington and Quincy Railway, has a paper on that subject, I believe.

The Secretary: Before Mr. Ryder begins to read his paper I wish to say that we understood that the papers should be sent to the Secretary in time to be printed before the meeting. Perhaps we did not insist sufficiently upon that, because, as a matter of fact, we only had a few papers in time to print them, one from Mr. Chenery, and one from Mr. Ryder.

I waited until the eighth of June, and not receiving any more papers. I had those two papers printed and forwarded to the members.

Mr. Davis: As Chairman of the Topics Committee, I would like to make a request to the effect that the rule established at the last meeting be waived, so far as prae-

licable, for the reason that some of the men who have been asked to participate in this programme, probably did **not** receive a copy of the Minutes of the last meeting, and **were** not present at the last meeting. I have with me **papers** from two or three gentlemen who were requested to **take** part in this programme, and if the members present see **fit** **t**o allow those papers to be read, I would appreciate it.

Mr. Ryder's paper is as follows:

DISPATCHING TRAINS BY TELEPHONE.

By W. W. Ryder, Supt. Telegraph C. B. & Q. Ry.

The proposition of substituting the telephone for the telegraph **in** the handling of trains has in the past been the subject **to** much discussion.

The electric interurban roads early recognized the desirability **of** this means of communication for the purpose mentioned, and as the number and speed of their trains and the **weight** of equipment increased, necessitating a more exact **method** of dispatching, they extended their use of the telephone until it is now recognized by them as the standard **method** of operation.

The steam roads, however, with their ultra-conservatism, were **loath** to part with the long established telegraph, and, while a little experimenting has been done from time to time **in** a very small way, it is only recently that the use of the telephone for this purpose has been attempted on a sufficiently large scale to secure a fair demonstration of its possibilities. The immediate incentive for these experiments was the near approach of the date for the enforcement of the Federal nine hour law, coupled with the well defined shortage of telegraph operators that had existed for two or three years.

The first experiment on the Burlington of handling trains

exclusively by telephone was begun on the 11th of last December, on the portion of our Main Line between Aurora and Mendota, a distance of 46 miles. Eleven offices were cut in on this circuit. The result was so satisfactory, that the construction of another circuit from Aurora to Galesburg, 125 miles, with sixteen offices was immediately authorized to handle the dispatching between Mendota and Galesburg. This circuit was completed January 24th and has been in use regularly since that date.

On March 1st the third telephone circuit was completed. This extends from Clyde, the end of the Chicago Terminals, to Aurora, a distance of 28 miles, with fifteen offices. These three circuits are all on double track.

On March 19th, the first installation on single track was completed between Aurora and Savanna, a distance of 106 miles, with twenty-three offices.

Up to this time, while many who personally investigated the matter were willing to concede its efficiency as applied to double track operation, they were very skeptical as to what would be the result on single track. In this distrust, they overlooked the fact that in our method of double track operation, the irregularity of reverse movements in reality made the requirements on such lines more exacting than on single track where opposing movements were perforce the regular method of operation. The results of this last installation were even more marked than on double track, and I am convinced that the handling of trains by telephone is not only much more satisfactory, but is really safer as well, and this opinion is shared by all who have personally looked into the matter.

Believing that the best was none too good for a train wire, we have in each case, with the exception of the Clyde-Aurora circuit, strung two 210 lb. copper wires and have made the installation as complete and perfect as we know

how. With the present market price of copper, the telephone circuit costs approximately \$100.00 a mile and the station equipment about \$50.00 per station. This is more expensive than the telegraph circuit, and the maintenance will be a little more difficult and the cost a little higher, but the results have proven so absolutely satisfactory, we feel the additional expense is fully warranted.

Our arrangement makes the circuit entirely self-contained, that is, the signalling and talking is all done on the same pair of wires. The signalling is done by semi-automatic selectors that enable the dispatcher merely by the depression of a couple of buttons in connection with a series of synchronous clocks to ring at will vibrating bells in one or more offices on the circuit. This is a much less laborious method of calling, and we also find a very great saving in time, the operators responding very much more quickly than is the practice with the telegraph. In the local offices we put a four inch vibrating bell, one large enough to be heard at a considerable distance, and when this bell lets go without any preliminary warning, the one thought of the operator is to shut it off and so he immediately answers the call. More often than otherwise the operators to avoid the annoyance of the signal bell forestall the dispatcher's call and report trains as soon as they pass.

In handling orders, the same general methods are observed as with the telegraph, any figures or names of stations occurring in the order being spelled out letter by letter, both in the giving of the order and all of the repetitions, and the name of the conductor on a "31" order is spelled out as well.

The use of the telephone is so quick in every way, and so much more flexible, the dispatcher is enabled to get far more detailed information of just exactly what each train is doing, even, when occasion requires, talking directly with

the conductor or engineer personally, and is thus brought just so much nearer the actual details of train movement. Only a personal investigation of the scheme can show how valuable is this information.

There has also been a marked improvement in the work of the men on these telephone circuits due to the fact that the conversations between the Dispatcher and the operators or other employes are of a much more personal character than obtains with the telegraph, resulting in much closer co-operation.

It is even possible to save considerable time in the actual putting out of orders. The Dispatcher copies the order in his order book as he talks it off, thus gauging, or rather reducing, his speed of conversation to his ability to write it down, as well as the ability of the operators to do so. Then when the operators repeat the order, they talk it off as fast as they can or much faster than is possible by telegraph.

The change in method in every case was made without a hitch and without any opposition worth mentioning. I had an idea that while possibly the dispatchers themselves might not openly oppose the change, their support might be of a passive character, but in this I was agreeably disappointed. The first circuit had not been in operation a week before a little spirit of jealousy was evidenced, directed against the dispatchers on the telephone circuit, it being so clearly evident they had the "snap" of the office. Soon all the dispatchers in Aurora office were desirous that we give them the same facilities, and now that all have been taken care of, there is not one out of the twelve that would willingly go back to the old method.

It is far easier to train telephone operators than to secure telegraphers. There is hardly a town anywhere on the line in which there are not young fellows, who by reason of their frequently being around the depot, are more or less

familiar with the railroad game, and who with a very little training would be perfectly competent to sit in as telephone operators. There is much to be gained by making use of men in their own home towns, or who have grown up along the Line. Our telegraph service was at its best when this condition existed to a considerable extent, and discipline has lessened in proportion as we have been compelled to import telegraph talent.

This increased use of the telephone has also opened an avenue whereby we can offer better employment to those unfortunately injured in our service, few of whom in the past have been able to learn telegraphy.

Another item worthy of consideration is the broadened field from which we can make dispatchers. In the past, the first requisite for a dispatcher was an ability to telegraph, and with the character and ability of telegraphers in general dropping as fast as it has during the past two or three years, we certainly can but expect difficulty in the future in getting satisfactory talent, even if this difficulty has not been greatly evidenced in the past. I maintain that a good, bright, young freight conductor, who has been actually carrying out the train orders, would make a better dispatcher himself and be better able to assist in getting other trains over the road than is the telegraph dispatcher, who, in spite of his occasional trips on freight trains, is a theorist after all.

The establishment of telephone circuits enables us to close unimportant offices wholly or a portion of the time, as a telephone instrument can be placed where the train conductors can readily get in touch with the Dispatcher, and report their trains into clear or get help if necessary.

Another important feature in the use of the telephone is the fact that it works even better in bad weather than in good—just the reverse of the telegraph—and if there is ever a time when good service is needed, it is when the

weather is wet and foggy. There is no exasperating interference with the dispatcher's efforts by reason of the relay in some way office being out of adjustment and the inattentive operator making no effort to see whether this is the case or not. The telephone is always in proper adjustment and because of the lowered static capacity of the circuits, works as if charmed.

With the telephone it is possible to arrange apparatus, for instance in the Superintendent's office, so that he can at any time listen to the actual work of the dispatchers and operators and thus check up any tendency to slackness. This has not always been possible in the past, as not all Superintendents were telegraphers.

The improvement in the handling of train dispatching by telephone has been so clearly demonstrated, we have decided to attempt to handle other messages in like manner and in a short time all business for the way offices on certain portions of our line (both main and branches) will be handled by telephone, this to include Western Union business as well. At junction points where branch telegraph lines are to be worked and at certain wire test offices, it may be necessary to maintain telegraph service, but at all other points all classes of business will be handled by telephone.

The field for substituting the telephone for the telegraph daily opens up before us almost faster than we can comprehend it, and the results we are obtaining from our experiments are a constant but very agreeable surprise. For instance, only about a month ago it seemed next to impossible to get satisfactory telephone service on single wire branch lines without completing the metallic circuit and this the volume of business did not warrant. However, within the last few days we have made successful substitution on two branch lines, one 18 miles long with three offices, and the other 49 miles long with ten offices. These branch wires

have been so arranged that while not connected permanently with the main line, they can be connected automatically at the will of the dispatcher or the way office operator, the signalling on the branch being done by means of ordinary bridged bells.

The unqualified success of our experiments with the telephone as a substitute for the telegraph, and the rapidity with which other roads are extending the work, convinces me that the next few months will make a great change in method of handling trains all over the country, one that will greatly benefit the service.

Mr. Ryder: Supplementing this paper I may give you an idea of what has been done in regard to train dispatching by means of the telephone during the last six months. On the New York Central road, an experiment on the main line was started a little earlier than that, but since that time, the following roads either actually established telephone circuits for the dispatching of trains or positive authorization has been given to them.

The Illinois Central leads the list in a pronounced degree. They have absolute authorization to extend the service on 2536 miles of road. The reason that they have come out so quickly is because they have wires on poles that were available. Of course, the expense for wire is a considerable item.

The Chicago and North Western have 478 miles.

The Rock Island has 333 miles.

The Michigan Central has 259 miles.

The Chicago, Milwaukee and St. Paul has 223 miles.

The Great Northern has 203 miles.

The Northern Pacific has 109 miles.

The Baltimore and Ohio has 105 miles.

The New York Central has 95 miles.

The Lake Shore has 88 miles.

The Delaware, Lackawanna and Western has 62 miles.

The Pittsburg and Lake Erie has 60 miles.

The C. P. R. has 49 miles.

I have included in this list the Branch lines of the Pennsylvania Lines east, 225 miles of which have been operated by telephone for some considerable length of time, signalling being done by the bridged Bell method.

The Lake Erie, Alliance and Wheeling, 104 miles, which has been operated in the same way.

This makes a total of 5674 miles, which is either being actually covered, or will be in the near future. A pretty healthy baby for six months growth.

This able paper was especially well received, and was discussed at length by S. L. Van Akin, Jr., of Syracuse, N. Y., assistant superintendent of telegraph of the New York Central Railroad.

He said that to successfully despatch trains by telephone, on account of the important nature of the work, it was necessary for the pioneers in the field to do considerable engineering in bringing about a departure from established precedent, both in the method of construction and operation. Defects in local battery telephone sets, from a service standpoint, were carefully considered, some of which are as follows:

When a receiver is left off the hook, the bridging bells on a party line cannot be freely operated on account of the short circuit, and in case two or more parties are wanted, the first party called is obliged to "hang up" until the other stations are signaled, and, as sometimes found, the insulation on the hook becomes carbonized, thus failing to cut

the receiver out—or partially so—cutting down the ringing of bells, while it would not noticeably cut down transmission. When the receiver is removed from the hook, the transmitter circuit is closed as well as the receiver circuit which often times will cause interruption to communications between other offices on the line, due to speaking before listening, vibration from telegraph instruments, engines whistling or ringing bells, or noise from passing trains.

To obviate these objectionable features, it was recommended that a 2 m.f. condenser be placed in the receiver circuit, and about the time the New York Central was ready to place an order for equipment, we were able to obtain receivers of 700 ohms resistance. The 700-ohm receiver wired in series with the secondary winding of the induction coil (which is standard practice) and a 2 m.f. condenser across the line, brought the bridging resistance of the set, when operative, up to approximately 1140 ohms, and with twenty or more stations so equipped, and cut in circuit, it was found that as many bridging bells in series with a 2 m.f. condenser would freely operate. To prevent interruption to communications between other offices, when listening in, it was recommended that a line key and a transmitter key be installed at the outlying offices, the line key being locking, the transmitter key non-locking. In this particular class of work, as it is essential that an operator have the free use of both hands, it was therefore deemed expedient to design a telephone arm having upon it a transmitter and a receiver. The latest improvement in this connection is on exhibit.

With a transmitter and receiver mounted in a fixed position on an arm, it follows that if the ear is pressed to the receiver, the mouth is brought close to the transmitter mouth-piece, insuring good transmission; head telephones were not recommended for use except by the train dis-

patcher, who wears a chest transmitter, on account of the wear and tear on cord, and the liability to breakage, and a tendency not to speak directly into the transmitter with this type of apparatus.

Bridging bells were installed at every third station for emergency use only, as it was not advisable to use ringing current on the line except as stated (for emergency calling) for the following reasons: The first and most important is the liability to de-magnetize receivers; in this respect we have experienced considerable trouble at Ravena, N. Y., which is the monitoring station for our long distance telephone lines; the receiver at that point is de-magnetized and a new receiver required on an average of every thirty days, due to ringing in the wire chief's ear; second, ringing in operator's ear; third, confusion of bells ringing incessantly where the lock and block signal system is in use, as in our case; fourth, a bridging bell would be required at each station on the line, tending to cut down transmission.

With these facts in mind it was recommended to install the Gill telegraphic selectors on the old despatching Morse circuit, and to provide automatic sending keys at the despatcher's office. This was done, but proved a failure, first, because being too slow, and, second, because unreliable, due entirely to outside interference in breaking up the combinations. After much experimenting and hard work by all concerned the Gill telegraphic selector, new type, was finally installed, being the third installation tried out. It is operated over the telephone line, the service being very satisfactory and the operation absolutely reliable.

Arrangements are now being made to extend the original circuit to Little Falls, N. Y., with an additional eight stations, making a total of twenty-five stations, in a circuit seventy-three and one-half miles in length. •

Our experimental circuit between Albany and Fonda,

forty-four miles long, was ready for service September 29, 1907, but was not made operative until October 2, as the railroad company were not able to meet the conditions of the nine-hour law (New York State, effective October 1, 1907), with telegraph operators, and, for obvious reasons, it was thought best to commence operations by telephone after the conditions of the law had been met. The spirit of antagonism toward telephone train dispatching has been very pronounced with us from time to time during the past nine months, but the issues have been successfully met.

I appreciate this opportunity to endorse what Mr. Ryder has said with regard to the practicability and superiority of the telephone over that of the telegraph in the handling of train movements.

Mr. Ryder's paper was fully discussed at the afternoon meeting in Executive Session.

On motion, adjourned to meet in regular session at 9:30 A. M., Thursday. Executive Session called for 1:30 P. M.

SECOND SESSION.

The meeting was called to order by the President, Mr. E. P. Griffith, at 9:30 A. M., Thursday, June 25th. In opening the proceedings the President said:

Before proceeding with our regular order of business, our Secretary has some letters to read.

The Secretary: I have letters and telegrams of regret at inability to be present from the following gentlemen:

H. C. Hope, St. Paul, Minn.

C. F. Annett, Goldfield, Nev.

Walter L. Connolly, Supt., C. I. & S., Gibson, Ind.

E. E. Torrey, Mobile & Ohio, Jackson, Tenn.

B. S. Jenkins, Winnipeg.

U. J. Fry, Milwaukee, Wis.

I think those are all the communications we have which have not been read.

The President: Before proceeding with the order of business I would like to state that just before I left New York I met a gentleman whom you all know, and who has been with us on many occasions. I know when I mention his name you will feel that he is here now. He wished me to express his regret at not being able to be present, and to say that although he was not present, he loved you none the less. I refer to our old friend, Mr. Belvidere Brooks.

I have the same message from our old time friend, Mr. C. H. Bristol. (Applause).

We will now proceed with our regular order of business.

The first item we have is a paper written by Mr. J. P. Church, Chief Clerk Telegraph Department, Wabash Railway Company. Mr. Church is not here so I would ask the Secretary to read his paper.

The Secretary then read Mr. Church's paper as follows:

COMMERCIAL REPORTS.

J. P. Church, Chief Clerk Telegraph Department,
The Wabash R. R. Company.

I find it about as difficult to write about Commercial Reports, as the average operator does to make them up, but have tried to include a few practical suggestions looking toward simple but systematic methods of handling them.

I assume that it is not desired to consider the question of improving the present rules as contained in the tariff book, and indeed they seem, if intelligently carried out, to cover all requirements fully, and suffice in the hands of the Telegraph Company's experts to reach all delinquents, especially in the collection of deficits on error sheets. We recently received for collection an error sheet amounting to 25c. on a message handled 21 years ago, and a system so far reaching could scarcely be considered inadequate.

It is difficult to lay down specific methods of instruction supplementary to the rules, on account of the difference in details on the various roads. I understand that the Western Union and Postal rules are practically the same and that the manner of making reports is consequently similar, and there is probably no greater difference between them than obtains in the practice of the different roads handling commercial business for the Telegraph Companies.

On the Wabash, the reports are sent to the Superintendent of Telegraph, where they are carefully audited and corrected, and sent to the several Western Union Superintendents, with consolidated statements on form 23, and a comparative statement with the same month of the previous year. The telegraph receipts, however are remitted by the managers direct to the Western Union Treasurer accompanied by form 65 (letter of transmittal), and a statement of manner and amount of remittance is forwarded to the Superintendent of Telegraph on form 1517, enclosed with the other reports.

Error sheets come to the Superintendent of Telegraph from the Western Union District Superintendents, and are copied in the error sheet book, and then sent to the various offices with a receipt card and a sufficient number of postal cards, form 47 for adjustment. The receipts are carefully checked in and tracers kept going in such cases as are necessary, until the error sheet is returned. The money covering deficits is returned to the Superintendent of Telegraph with the error sheets and overcheck vouchers, and remitted by him at the close of each month, together with a statement covering the error sheets returned.

When Mr. Kinsman turned this matter over to me he suggested that the best way to secure prompt and correct reports was to insist upon careful and comprehensive records being kept by the managers, and I believe this is

the key to the whole situation. The time for the manager to begin to make up his report is when he handles the first message, and he should be required to keep a proper file of all commercial business separate from the railroad files, and each day by itself.

For the average office, a simple file of about three divisions will be sufficient for the current month.

The first division should be large enough to hold all messages handled during the month.

The other two divisions will require only sufficient space for the messages held out to go in with the reports in one, and the error sheets and correspondence relating to them in the other. If nothing better is available, a table drawer for the messages and two large envelopes for the other divisions will answer.

Each day's business should be assorted carefully on the following morning, and placed in alphabetical order by states, and after proper entry in the check ledger, copies should be made of the Uncollects and Guaranteed messages, and the service messages relating to them; also the Sent Free Half Rate Frank, and all Government messages that go in with the reports, as vouchers for tolls, and these copies filed in proper order with the other messages for that day; care being taken to wrap or tie up each days business separately for convenient reference. Service messages should be attached to the messages they refer to, with pins or pasted on one corner.

Daily records should be made showing amount of the receipts, and the number and kind of messages handled, both sent and received, so that this information will be tabulated and ready for use in making up the reports. This record can be kept on the check ledger by writing suitable headings at the top, and will only require half of one page each month.

The original messages held out to go in with the reports can be kept in proper order in the second division of the file, until reports are made up at the close of the month, leaving the third division for error sheets and correspondence of the current month.

Press or carbon copies of the reports should be made and filed with the messages of the same month.

If the daily register (form 40) is used, that and the check ledger can be kept on top of the messages in the first division of the file.

In addition to the three division file, the manager will need a place to store his stationery supplies conveniently, with a separate shelf for the eight bundles of messages that he is required to keep on hand.

It will scarcely be necessary to provide a money drawer, as the manager can use one of his vest pockets for that purpose. The only Western Union office I ever managed took in between twenty and thirty dollars a day, and I carried the Western Union cash in one pocket and my own in another. This arrangement worked very well—the only difficulty being to preserve a proper balance between the pockets.

If the managers can be induced to adopt some simple system of filing the messages and daily make copies of such as will be required to go in with the reports, a few minutes work each day will keep their files in good condition, and enable them to make up their reports easily and accurately at the close of the month, and reduce the number of error sheets.

Instructions to managers should be as brief and simple as possible, but they should be constantly admonished to study the rules carefully and obey them implicitly, referring doubtful points to the Superintendent as they come up, and if they follow the practice of making up their reports

daily they will have ample time to obtain advice on all obscure points and be prepared to send in their reports without delay at the end of the month.

Experience indicates that operators are frequently careless about complying with the rules to see that all messages are written on or attached to, the sending blank, and that they often omit the filing time on sent messages and sometimes neglect to endorse the time on messages received, and time of calls on delayed messages. They should be specially cautioned on these points and also impressed with the necessity of taking receipts for messages delivered and filing these receipts with the day's business.

The Secretary: We have a paper written by Mr. O. C. Greene, Superintendent of Telegraph of the Northern Pacific Railway Company, on the "Reduction of Telegraphing by the Use of Printed Forms." Mr. Greene is not here, but the paper has been brought us by Mr. Dildine. Unfortunately Mr. Dildine is not in very good voice this morning, and has asked me to read the paper. In fact, I may say that Mr. Greene himself wrote and asked me to read the paper. Mr. Greene was my boss at one time, and whenever he said that he wanted anything done, we were very willing and ready to attempt it at any rate.

The Secretary then read the following paper from Mr. Greene:

REDUCTION OF TELEGRAPHING BY THE USE OF PRINTED FORMS.

By O. C. Greene, Supt. Telegraph, N. P. Ry.

When I was requested to write a paper on "Reduction of Telegraphing by the Use of Printed Forms", I was inclined to hesitate about complying, as it seemed to me there was not much that could be said to a body of men so well

posted on this subject, as all of you undoubtedly are, that would be either interesting or instructive.

There is no doubt that where there are any considerable numbers of routine reports of similar character, the use of an intelligently arranged blank form materially reduces the amount of telegraphing. When the requirements are known, it is a comparatively easy matter to make up a blank form, with suitable columns and headings, to meet them. An arbitrary designating letter should be placed at the top of each column and, when necessary, at the beginning of the line, which should, of course, be transmitted by the sending operator, to indicate to the receiving operator which space to use. Care should be used in selecting this index letter to use Morse characters which will not be apt to combine easily with those of the numbers or words most likely to follow it.

To obviate the difficulty the receiving operator is likely to experience in finding the proper place, especially if the blank is large and the sending operator inclined to be very ambitious, the spacing should be rather liberal and the subdivisions of the form should be separated by heavily ruled lines; otherwise, so many errors, due to operators using the wrong spaces, may follow, that the saving effected by the use of the blank is likely to be largely off-set by the number of messages made necessary to secure corrections.

Multiplicity of forms is objectionable. As a general thing the telegraph tables are pretty well crowded and considerable time may be lost by operators looking for the proper blank when there are a great many to select from. While the use of blank forms is undoubtedly advisable when the amount and character of business justifies it, there is, therefore, a chance of overdoing it. Conditions frequently change, requiring additional or somewhat different information, and it will be found that many times a slight change

in some of the established forms can be made to take care of this change in conditions, rather than making a new blank for the purpose.

The Northern Pacific Railway, which I have the honor to represent, being long and the general office located at one end, necessarily carries on a great deal of its business by wire, hence a large number of forms are in use, which greatly reduces the volume of telegraphing.

Should any of the gentlemen present be interested, I will be glad to present them with complete sets of our blanks upon application.

President Griffith. With the consent of the meeting, I would like to suspend the order of our proceedings for a few moments.

We have with us a gentleman who intended to be here yesterday morning, but, unfortunately, the dates were misplaced. I know you will all be glad to hear from him now, and, therefore, I have much pleasure in introducing to you, Mr. Narcisse Lapointe, Acting Mayor of the City of Montreal.

Acting Mayor Lapointe: Mr. Griffith, and gentlemen, in extending to you, on behalf of his Worship the Mayor of Montreal, a hearty welcome to this city on the occasion of your twenty-seventh annual convention, it is not necessary for me to address you at any length. The vital importance of the interests you so worthily represent, commercial, professional and national, is universally recognized. But, in no country has the Railway Telegraph been reduced to such an exact science as on the North American continent, and nowhere does it play such a prominent and significant part in the national life. It is upon you gentlemen that the press of this Dominion, no less, (I might say) than the press of the United States, in a large degree, depends for its news

service. It is upon your fidelity, accuracy and competence, that the fate of immense commercial, inter-state, and even national interests often depend. You play a part in the life of both countries second to none among those employed in the service of public utilities and you play that part ably, independently, and fearlessly.

A special interest attaches to this occasion, as the second upon which you hold your annual convention here—being the first in a great many years—for Montreal is the headquarters for the Dominion of Canada, of every great telegraphic service of the Dominion; in fact, for telegraphic service, Montreal is the Chicago and the New York of the United States combined.

I feel sure that your meeting here will go far to strengthen the bonds of friendship which unite you and your fellow superintendents on this side of the imaginary line, and that nothing but good can come from such fraternal union.

It but remains for me to bid you again a hearty and sincere welcome to the Canadian Metropolis, and to express the hope that your brief sojourn here will be fraught with benefits in which we shall mutually share.

I am sorry that I was not here with you yesterday. I understood that your meeting opened on the twenty-fifth. However, I am very glad to learn that Alderman Sadler was here to welcome you yesterday, and that he did it so well.

Mr. Camp: I feel that I must apologize to Alderman Lapointe for the error which has occurred.

The first programme I drew up, through some inconceivable carelessness on my part had the wrong date. I telephoned to the office yesterday, and found that there was an error. I am very sorry that this should have occurred, and personally apologize to Alderman Lapointe for mis-

leading him, unintentionally it is true, but misleading him all the same.

The Chairman: The fact that there is one day's difference in this matter, perhaps makes it all the more enjoyable to us.

We are always glad to meet the officers and representatives of the different cities wherein we hold our conventions; and, on behalf of this Association I wish to thank Alderman Lapointe for the kind courtesy extended to us, and at the same time to assure him that we are having a very excellent time, and are being well taken care of.

The President: We will now proceed with the order of business which we had started.

Mr. Ryder: There is one point brought out by Mr. Greene's paper. I understand that he uses code letters at the heads of columns on report blanks. Does it not occur to you that there would be some difficulty in picking out code letters which would be clear in the Morse transmission? That is what we have endeavored to do in the past, and when the change was made to handling the business by telephone (as has been done on two or three sections of the Burlington Road) we are right up against the proposition of a symbol letter which is all right telegraphically, but is all wrong telephonically.

Now, on two sections of lines we are handling all the business by telephone, and the most serious trouble that we have bumped up against is this question of the form—the letter designation for columns. We are going to handle more business by telephone in the future than we have done in the past, and this is one of those items that we have to bear in mind, in making up our blanks in the future.

Mr. Selden: The thought occurs to me that possibly it is all very well to head your blanks for telegraphic pur-

poses with a letter character, and to choose a number for your telephonic lines, say, 1-1, 1-2, 1-3, and so on, instead of A-B, B-C, and so on, so that instead of transmitting by telegraph, they will use the alphabetic designation by telegraphic and by telephone use the number designation.

Mr. Ryder: The objection to that suggestion is that you are liable to confuse the numbers indicating the columns with the figures which appear in those columns.

Mr. Selden: In any case could it not be designated by a letter and a figure, say, 13-B, or 14-X, or 15-X, or whatever it may be.

Mr. Ryder: We will have to have some different method from anything in existence at the present time, I think.

Mr. Camp: Why should it be necessary to have any indicating letter or figure, if you are using the telephone? It is perfectly easy and simple to mention the heading of your column when you are speaking to the party who is to make the entry. It seems to me that it is not necessary to have any indicating letter or figure at all.

Mr. Ryder: The only reason for an indicating letter or figure would be for the sake of brevity. I have in mind one column which we use on our road, which is headed "Burlington Route, 34 foot Box". We would have to get something shorter than that, and one word would possibly do it. The difficulty is to get words which will do it satisfactorily under the new conditions.

The President: If there is no further discussion on this paper we will pass on to the next subject; but before doing so I wish to read to you a telegram which has just come into my possession. It is headed "New York State Telegraph", and is dated, New York, March 6th, 1851.

"This despatch has just been received from Albany for R. W. B. J. Harnott—G. S. of G. Send a dispensation for

three degrees of Masonary, and charge same to Washington Lodge No. 85."

Mr. Selden: Have they ever been able to find out where the delay occurred?

The President: We will now proceed with our regular order of business.

Our next item is a paper on "Dry Battery", by Mr. U. J. Fry. Mr. Fry is not here, but I understand that the paper is in the possession of Mr. Davis, Chairman of the Topics Committee. I would therefore ask Mr. Davis to read Mr. Fry's paper.

Mr. Davis then read Mr. U. J. Fry's paper on "Dry Battery", which is as follows:

DRY BATTERY.

By U. J. Fry.

We beg to report to you the final results of our experiment with dry battery block wire service between Brookfield and Waukesha, referred to in our note of last year, to effect that the 32 cells used, failed after three years service, and means an expense of \$5.12 as against \$102.00 first cost and maintenance for three years of 32 cells gravity battery.

As applied to the service on a Railway operating 2000 miles of block signal service and using our present form of block wire we estimate the 4000 cells of gravity battery necessary, first cost and maintenance, for three years at \$14,000.00 while double the number of dry cells (8000) will cost \$1280.00, or a difference of \$12,720.00; \$4,360.00 per year or \$2.18 per mile of road per year.

While constructing a telegraph line along our Coast Extension Railway we found it impossible to prearrange for gravity battery service and are using dry battery temporarily by connecting up a sufficient amount to operate a

wire one hundred, or one hundred and fifty miles in length, inserting a sufficient amount of resistance to bring the current down to about 50 M. A. while the circuit is short. When more wire is added we cut out resistance from time to time to equal the wire resistance added, maintaining as near as we can 50 M. A. current.

You can readily appreciate that by using a large number of cells, and inserting resistance, the discharge from each cell will be exceedingly low, the expense small and convenience afforded us in that, that we can carry the battery with the construction outfit until needed, when we can set it up in almost any place and pay no further attention to it except to cut out resistance occasionally. We used a set of dry battery in this way for six months, when it failed, at which time we had arranged for gravity battery service.

While it is not possible at all times to find a safe place for gravity battery to operate local sounders we found it very convenient to use 50 ohm sounders and keys only until we can construct station houses and arrange for standard instruments.

In these concluding lines on dry battery we find we have been unable to give you as much information as we should like to have done, and in lieu of what we did not say, and assuming you will permit, we thought perhaps a few of our shop notes might serve to interest some of your younger men in the service, and I submit the following:

To determine the number of cells of gravity battery necessary to furnish approximately 30 M. A. current for 1, 2, 3, 4 or 5 wires, when the resistance of each is about equal, select one of average resistance, add the relay resistance; multiply by constant given below, and opposite the number of wires under consideration. The amount shown will represent the total number of cells required, which should be

divided and half the number placed at each end of the circuit.

Number of Wires.	Current M. A.	Constant.
1	30	.032
2	32	.034
3	34	.0365
4	36	.039
5	38	.0415
1	45	.049
1	50	.055
1	55	.061
1	60	.066
1	65	.071

While it is not theoretically correct, this formula will be found sufficiently so for ordinary cases.

It is understood that when using gravity battery the current will be reduced about 2 M. A. for each wire added on account of the internal resistance in the battery, while with dynamo current the drop, if any, will not be noticeable.

In each of the cases shown, when all wires are closed, each will receive approximately 30 M. A. If one should be opened, the current in each remaining closed will rise about 2 M. A., etc. Should three be opened, the current in those closed would rise 6 M. A.

Not more than four wires should be fed from the same source, because the variation during damp weather, when it is necessary to adjust high, becomes so great and margin small the wires will not work well. Five wires would cause a variation of 10 M. A., and you can appreciate what this means under such conditions.

When inspecting our main line battery, or for testing one or more cells of dry or gravity battery, we find it convenient to have a small compass with us. One that costs 25c will answer the purpose, and by making a few tests

with battery we know is bad up to one we know is in good condition we can form some idea as to what reading we should have and decide accordingly.

Place your compass conveniently near the one or more cells, bring a wire from one pole of the battery to the compass, place it on the compass immediately over and parallel with the needle, hold it firmly with one finger, and when the needle is quiet complete the circuit with a wire from the other pole and note the reflection of the needle.

While you, no doubt, are familiar with these matters, we thought perhaps some of your men may have forgotten, and it is for such we respectively submit these items.

Mr. Davis: Mr. Fry has forwarded a key to the Secretary, as a sample of the key he is using. It seems to be just the reverse of the ordinary key, inasmuch as when you open it, it is closed, and when you close it, it is open.

I do not feel qualified to explain the workings and advantages of this key as they should be explained, and would ask our Secretary to find someone here who knows all about it to do so.

The Secretary: I think Mr. Ghegan knows as much about it as anyone else in the room, seeing that he is directly connected with the manufacture of the key. I would ask Mr. Ghegan to explain the key.

Mr. Ghegan: It is a key that Mr. Fry designed for us, for the dry battery in a telegraph system.

The object of having the circuit closer on an open circuit key was so that the operator would not have to learn anything new when he starts to transmit with this key. He throws the circuit closer open in the ordinary way, and that places the dry battery in condition to transmit the message. When he gets through he closes the circuit closer in the ordinary way, and that not only throws the dry battery

out of circuit, but it also leaves it out, so that you do not have the battery in the circuit, and it is not put into the circuit by pressing the key—which is something that is very important. It frequently happens that a book or some other heavy object gets on the key, pressing it down and closing the circuit. With the ordinary key this would put the battery into circuit, but with this key it is not the case.

The key closes the battery out, but leaves the relay in to receive signals.

Mr. Selden: Does this require a battery at each station sufficient to work the whole line?

Mr. Ghegan: Yes. It is an open circuit key.

Mr. Williams: What battery do you use for seventy-five miles of line, say?

Mr. Ghegan: I think Mr. Davis would be able to answer that.

Mr. Davis: I am afraid I cannot.

Mr. Williams: I have 154 miles of dry battery block work, and I use about one and a half cells to the mile.

Mr. Camp: What gauge wire do you use?

Mr. Williams: No. 8.

We have used it for quite a while, and the battery has shown no depreciation whatever.

The President: Is there any further discussion on this paper?

The Secretary: Inasmuch as there does not seem to be any further discussion on Mr. Fry's paper, I will take the liberty of changing the subject.

When we met in this Hotel thirteen years ago, we had with us many men who are not here today, among them was a gentleman who took charge of our party from the time we

left Detroit till we returned. He is not now in the telegraph business, but, apparently has not lost interest in this Association. I refer to Mr. J. W. Fortune, who was Assistant to the General Manager of the Grand Trunk Railway, as well as Superintendent of Telegraph.

Of those who were present upon that occasion there are about ten here today, and I am sure they well remember what perfect arrangements were made for our accommodation and entertainment, and how very little we had to do ourselves in the way of getting around, for Mr. Fortune seemed to have anticipated everything possible, and to have made very complete and perfect arrangements.

I sent an invitation to Mr. Fortune to attend this meeting, and asked him to make a special effort to be with us here, so that we might greet him after his long absence. He has been unable to come, but I have just received a letter from him which speaks for itself.

Mr. Fortune says:

710 Chamber of Commerce, Detroit,
June 24th, 1908.

Dear Mr. Secretary: I am sending you by special messenger via General Offices of the Grand Trunk Railway "73" envelopes, all about the Goderich Summer Hotel. Every word of which is worth reading, if I do say it myself "as shouldn't." Judging from my own experience as to numbers usually present, I think I have sent sufficient to give a copy to every member present, if not, I shall be glad to mail others to the home addresses of any applicants. I wired you today my regrets and best wishes and asked that the committee on next meeting should not decide until hearing from me. I recognize the fact that perhaps a majority may desire that the next meeting should be in the United States, but as I think you have about exhausted the points of interest there, you may perhaps wish to try Canada once more, therefore, I beg to suggest that Goderich, Ont., "the coolest, cleanest, healthiest, and prettiest town in Canada"

may be considered. It is not a city but a beautiful, restful, interesting town and a meeting there would be somewhat out of the ordinary. Moreover if date were left open, say from the 15th to 25th of June, I think I could arrange a daylight yacht sail of eight hours from Detroit to Goderich for first day, then two days at the Goderich Summer Hotel which has a good convention hall, and a return steamer trip that would be remembered by everybody for many a day.

The Hotel rates would be reduced to \$1.50 and \$2.00 a day for each person on the American plan, and the party would have as a delightful rural and marine view as there could be found on any drives on this Continent, while our modest evening entertainments would also be much appreciated by the ladies.

I may have a little reputation among the older members for "trying to do things", and if you will leave yourself to my tender mercies once more, I will again try to "do you all up brown."

We have no bar in the hotel but plenty of the finest mineral water out of the earth, and if you decide to come as a body, I would like to have Selden and Kinsman see to it, that Ryder gets all the **long** drinks he desires.

If you cannot come as a body please remind each one of the members that the latch string is on the outside for every-one of them, their sisters, their cousins and their aunts.

It will soon be 26 years since a half dozen of us met in Chicago and formed our Association. Among the numerous Associations I have known during my railway life, I know of none which has been productive of more good and certainly none in which good fellowship and unselfish intercourse has been so genuine and so pronounced. It is because of this good feeling that I greet each one of you as **old** and **new friends** and which makes me desire to have you **all** with me once more.

With "73's" and best wishes, I am, as ever,

Your sincere friend and associate,

J. W. FORTUNE.

The President: The next item on our list is the paper prepared by one of our Past Presidents, Mr. E. A. Chenery, Superintendent of Telegraph of the Missouri Pacific Railway.

This is perhaps one of the most important papers to be presented at this meeting, and I would ask your very special attention to it.

Mr. Chenery: When the Topics Committee assigned me the subject of "Adverse Legislation", without any further information, and asked me to write a paper on the subject, I thought this was a sample of "adverse legislation" indeed. I did not know exactly what their idea might be, so I took the liberty of altering the title of the subject, and calling it "Adverse Legislation—Its Possible Ultimate Effect on Telegraphers."

Mr. Chenery's paper is as follows:

ADVERSE LEGISLATION—ITS POSSIBLE ULTIMATE EFFECT ON TELEGRAPHERS.

By E. A. Chenery, Supt. Telegraph Mo. Pacific Ry.

It is generally admitted that of the present officials of our railroads, fully eighty per cent. started their career by way of the telegraph route, and it at the same time is equally well known that no other avenue offers such an educational and sure journey to success, particularly in the operating, accounting or traffic departments, if proper energy on a sound foundation is applied.

No branch of the service is so full of promise to the young man fresh from school and with a desire to make for himself a name in the army of railroad workers, as is that of the telegraph department as a starter, and this clearly is apparent to those who consider their opportunities rather than their comfortable convenience; who know that honest

and unceasing endeavor must succeed and that slipshod methods and lack of interest cannot but fail.

The young telegrapher accepting his first position is in the Kindergarten class and cannot progress through the several grades to official position without constant and earnest application. He usually makes his entry into the service at some way station—on a branch road more than likely—where his duties consist principally in recording and reporting the passage of the few trains that pass his station during the hours he is employed. The actual labor involved is so small as to almost warrant the charge of extravagance for his meagre services and were it not that his presence may be desired in a possible emergency such as an accident or a disaster, there would be little reason for his position.

But the young man is engaged and we will admit is employed through no particular desire on the part of the management to be philanthropic. Let us see what his opportunities are: The actual work assigned leaves so much idle time on his hands as to permit him with profit to utilize many hours in perfecting himself either as a more proficient telegrapher or in familiarizing himself with the duties belonging to the agent or other employes at his station.

The art of telegraphy is not mastered in time measured by days, weeks or even months and there are few telegraphers of to-day who will claim they earned the right to wear the title in less than from four to five years. This is partly due to the fact that in some cases after serving as an apprentice for from six to nine months and then securing a position, the temporary goal seemed to have been reached and continued effort is slackened on the theory, I take it, that there is no further necessity of running after the street car is caught.

If advancement is desired and expected it surely must

be deserved and the result can only be obtained after a supreme effort to perfect oneself is made.

Every telegrapher at such an initial station, has opportunities to practice many hours daily and to become acquainted with many of the duties required of telegraphers more advanced and of the station and train work generally. He has access through passing telegrams to the best thoughts of his superiors and may be in close touch in advance of the press with the news and gossip of neighboring towns and cities and should be the best posted man in the village.

Ambition when accompanied by applied effort and recognized though suppressed ability, will not be permitted to tarry long in such a place, as the dispatcher, the agent or some other representative will have observed the traits and qualities of merit manifested, and a summons in the way of an offer for a better position is forthcoming. The new position carries with it, more work, greater responsibility and opportunities for acquiring knowledge of the ticket, freight, accounting, commercial and railroad telegraph, express and other details and to become more closely identified as a part of the great machinery going to make up the large industry of a railroad.

As this knowledge becomes broader, a larger field is opened. An agency presents, is accepted and the young man then becomes the road's one and direct representative and is usually regarded as the one person to whom inquiries of all sorts may be directed, with a reasonable certainty that a correct and intelligent reply will be received.

Continued application and association through personal contact and correspondence with general officers and the patrons of the Company has by this time added much to his education and self-reliance and if his energy and temperament are cultivated further in the right path, success is now in sight.

Whether he be fitted to advance to the position of train dispatcher, as an expert telegrapher in one of the more important offices, or to a more representative position among the people, in the traffic department, or from his association and acquaintance with the commercial world, he chooses to engage in other pursuits, the opportunity is bound to present.

Of the 80% of railroad officials who began as telegraphers, by far the greater number are of the operating department. Train Dispatchers are advanced to Chiefs, then to Train Masters and in succession to Superintendents, General Superintendents, General Managers and Presidents. In the front ranks of the traffic and accounting departments are many who started in the Kindergarten class of telegraphy and worked their way through the position of agent, cashier, ticket clerk, etc., to traveling auditors, freight or ticket agents, to more responsible positions at the head of such departments.

Within a period of two years past, following their efforts and success in very thoroughly effecting a strong organization, a spirit of unrest, in keeping with the times, has pervaded the ranks of telegraphers engaged both in railroad and commercial fields and it only needed the torch of disgruntled agitators to fan the flame through a hitherto unthought of method—legislation—into a blaze that it seems to the writer is fraught with possible disaster to the profession.

There are three classes of legislation, Internal, State and National, that at this time seems to contribute as a demoralizing factor against the welfare of the telegrapher.

Internal legislation may be considered that which applies as between the telegraphers as a class, and the corporations with which they are identified.

Nearly all the trunk lines at this time, following the custom of having working schedules with employes in the

various trades, have entered into similar relations with their telegraphers and it is but fair to say that such a policy if made and carried out with the fundamental purpose of preventing abuses to a particular class, is beneficial in a general way, although personally the writer cannot believe that all the rules and particularly those relating to seniority is conducive to the encouragement of ambition and advancement.

Some of the schedules are secured after a long struggle, due to the fact that the committee delegated to frame the requests often assume an attitude of hostility to the management and convey the impression that the employer is a sworn enemy and must be so treated. In the preparation of such agreements the principal object should be to insure as nearly as possible, a uniform working arrangement for all divisions, providing reasonable hours of service, an opportunity for a hearing in the event of fancied or real injustice and compensation commensurate with the duties and experience required, location and other conditions being also considered.

These schedules are made to be observed and managements are anxious that the provisions are not violated, recognizing in them as sacred an obligation as is expected of the employes in complying with the rules laid down for their guidance by the Company.

There is a certain element, however, who rebel at any order that may be issued; who look upon a letter of inquiry for desired information, as an attempt to harass them and the writer has known of several cases where the employe before making reply to such queries, has first communicated with his chairman to ascertain if the superintendent or other superior officer was not transgressing upon what he considered the conferred rights of the schedule.

Such an element find it very convenient to complain of alleged violations on the part of their superior officers and

at the same time criticise the actions of their selected committee in permitting the practices which they consider burdensome, to continue. They are usually handy with pen and speech in vituperation and consider an ideal schedule only that which contemplates a stated minimum salary with liberal compensation in addition for handling tickets, freight, telegrams, express, mail and all other duties that may be assigned. These extreme examples are not altogether rare and are of such a number as to breed discontent among the larger amount of employes who are taught that their awakening can only result from a following of such precepts.

Could these employes be but brought to a realization of the sense of allegiance they owe themselves and their employer and strive to qualify and merit promotion, it stands to reason that their prospect for advancement would be greater.

What commercial business house could succeed if their salesmen banded together in an effort to force rigorous rules and to prevent any one man, regardless of his experience, from serving at a lesser rate than his older and necessarily more competent comrade. Would the head of such a concern feel disposed to offer a partnership in the business to one of that class of employes, or would he rather choose from among those who had at all times proven competent and loyal to his interests?

Not content with the working schedules they had entered into with their employers, presumably in good faith, the telegraphers as an organization conceived the plan of enlisting the efforts of their State and Federal representatives in an endeavor to secure shorter hours of service, relying on their organized strength to maintain the present or an advanced wage scale and State and National legislation relating to the employment and regulation of telegraphers has been active within the past two years.

Maryland was the first State to enact a law prescribing eight hours for telegraphers engaged in reporting trains, and the example was soon followed by other States, in many of which the law was to become effective sixty days from date of passage, allowing the railroads scarcely any time for preparation. In seeking this legislation, the telegraphers who were delegated to assist in having the acts become a law neglected to call attention to the fact that train dispatchers and telegraphers working tricks requiring constant and close application were then and have been for years, working but eight hours daily, and the attempt was made to have such hours apply to all without regard to the responsibility assumed; no distinction being made as between a dispatcher directing train movements and telegraphers who mechanically receive and deliver such instructions to the trainmen who are to obey them.

No one familiar with the work at the various stations of a railroad would honestly make the claim that the "mental strain" on a telegrapher on duty at a station where the number of train orders received varied from two to ten each month or even that number in each 24 hours, was particularly severe or compared in any manner with the duties in a dispatcher's or heavy division office, where close application is required and the work correspondingly heavy. In the one case the hours of duty may extend over a period of eleven hours each day, but the actual work is not heavy and there are in many cases long periods with nothing whatever to do. In the other case, the hours of duty are fixed at not more than nine and many at eight or less.

A case where one accident resulted in great loss of life which occurred through the negligence of a telegrapher failing to display his signal to one of the trains involved, has been recited before every committee having such bills to consider. The claim was made that the telegrapher at fault

was overworked, but the full facts in the case of his companion operator going to a neighboring city without securing permission from the dispatcher or superior officer, or with their knowledge or an understanding made by the two men to double, was not explained.

In a few of the bills introduced, a modification was suggested that the law should apply only at stations where the number of passenger trains passing in a 24 hour period exceeded eight in each direction, but this attempt to regulate the hours of service to the work performed met with vigorous opposition and protest and demonstrated the fact that methods absolutely unfair are resorted to in an endeavor to gain their point.

While these and hundreds of other bills directed against the railroads were being discussed in the several States, a bill was under discussion in the House and Senate providing a maximum of 16 hours during which railroad employes affecting train movements, would be allowed to labor and stipulating the number of hours of rest such employes should have before resuming duty. No particular class was mentioned and in the last days of the session after the bill had been favorably reported to both Houses, a proviso was added by the House to the second paragraph reading as follows:

“PROVIDED, That no operator, train dispatcher or other employe, who by the use of the telegraph or telephone, dispatches, reports, transmits, receives or delivers orders pertaining to or affecting train movements, shall be required or permitted to be or remain on duty for a longer period than nine hours in any twenty-four hour period in all towers, offices, places and stations continuously operated night and day, nor for a longer period than thirteen hours in all towers, offices, places and stations operated only during the daytime, except in case of emergency, when the employes named in this

proviso may be permitted to be and remain on duty for four additional hours in a twenty-four hour period on not exceeding three days in any week."

In this form the bill was sent back to conference and after further discussion, a second proviso was added reading:

"PROVIDED FURTHER, The Interstate Commerce Commission may after full hearing in a particular case and for good cause shown, extend the period within which a common carrier shall comply with the provisions of this proviso as to such case."

The bill so amended passed both houses and was signed March 4th, 1907, to become effective one year after its passage and did go into effect on March 4th of this year.

I take the liberty of quoting from a statement made by Mr. C. R. Gray, Vice-President of the Frisco Ry., who served as chairman of the special committee of railroad representatives appearing before the Interstate Commerce Commission on February 27th last in a hearing on this bill:

"Inquiry among the important railroads developed the fact that to keep the train order telegraph offices open for the number of hours that they were kept open in November, 1907, and comply with this law as to hours of service would necessitate the employment of 15,000 additional operators. Based upon the rate of wages then prevailing, it would mean an added expense to the railroads of approximately \$10,000,000 per annum.

The Telegraphers' organization had in the meantime issued circulars indicating its contention to be that if the railroads would pay a minimum of \$80 per month, they could secure enough competent telegraphers who had gone into other business. Of course it would be impossible to pay this rate of wages to secure new employes without equally applying it to those already

in service and upon this basis the additional cost to the railroads in the United States would be approximately \$20,000,000 per annum.

The amounts stated are given in no sordid sense as opposing the expenditure of any amount for that matter, to insure safety, but solely in order that the public may know the cost which in normal times will attend the enforcement of this law. Capitalized at 5% it means an investment of \$400,000,000, which would provide automatic block signaling for 160,000 miles of double, or 266,000 miles of single track, the latter more by approximately 29,000 miles than there are in the United States.

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It is a fair assumption that if this case could have been heard last fall, the railroads could have made such a showing as to the impossibility of securing men, that an extension for that cause alone would have been within the bounds of reasonable expectation, but effective in November, as all know, there was a tremendous slump in the income of the railroads, which still continues. In order to meet this condition, the roads have made strenuous efforts at retrenchment. A great many telegraph offices absolutely necessary in times of normal business have been dispensed with entirely. This had made available a number of operators who in times of normal business could not be secured. The committee concedes that there are telegraph offices where the men should not be required to work in excess of nine hours. It contends, however, that there are a greater number where the telegraph train order responsibilities are so immaterial that relief in such cases is reasonable and just; and further, that the commission should have authority, when a railroad has pro-

vided automatic block signals protection, removing thereby any opportunity for the operator to be instrumental in safety in any degree, to exempt such carrier from the operation of this law on that portion of the railroad so protected. It believes, and this belief was strengthened by conference with a great number of Senators and Congressmen, that there is a misconception as to the relative duties of a train dispatcher and a telegraph operator. A number of Congressmen felt the term to be synonymous and the responsibilities to be the same.

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One of the great difficulties in this law as viewed by practical railroad men, is that it does not bear equally. It is hard to conceive the logic which allows an engineer and conductor to remain on duty for sixteen hours and limits a telegraph operator to nine. It is also difficult for one to comprehend the logic which permits one telegraph operator to remain on duty thirteen hours, but limits another to nine. But by far the most alarming feature in connection with this portion of the law, is that before it becomes effective the law served to defeat the purpose announced in its title, i. e., 'to promote the safety of employes and travelers upon railroads,' in that a number of the carriers were able to and did testify that they have already been compelled to curtail the block signal protection afforded on their lines, and had abandoned any immediate intention to extend it, first on account of the arbitrary cost involved in obeying the law and second because they know from practical experience that in times of normal business, a force of operators competent to handle the block signal system could not be obtained if only nine hours can be worked."

Considering the welfare of the telegraphers, I cannot believe that shorter hours of service was wanted or desired so much as a maintenance of an established wage scale and constant employment and the advantage of fitting themselves for promotion. No request by a committee for a reduction in the regular hours of service was ever made to my knowledge and these experiments in legislation of licensing telegraphers, the prohibition of employing anyone under 21 years of age and other similar measures that have received attention, were directed at the railroads through the efforts of the leaders of the telegraphers' organization to force a closed shop and to create a demand that would apparently benefit the present employes, but which is now acting as a boom-crang.

The telegraphers, in what I believe mistaken zeal for the general good of the profession, have in every way possible, discouraged the teaching of the art and as a result the timber from which such material has been made of recent years has not been such as to justify the faintest suspicion that the percentage of future officials will be among the high figures of the past. The president of the telegraphers' order in discussing this feature at Washington recently, admitted that less than 365 students each year was authorized and permitted to be taught telegraphy by members of his order, although claiming a present working force of upwards of 53,000 telegraphers in the United States. At this rate of sanctioned manufacture, the last of the 53,000 telegraphers now employed would be released from active service in approximately 145 years. These figures would be changed somewhat if the mortality was lengthened or comparatively few additional positions created.

The biblical paragraph "What profiteth a man" may be converted into "What profiteth the telegraphers as a class, if they gain a few additional hours of idleness by losing their prospect for advancement."

A few are temporarily benefited in the shortening of their working hours, but is this conducive to a promising future? The passage of such laws necessarily has a demoralizing effect. Its tendency is to provoke discontent and stifle ambition; it encourages a revolution in methods and its ultimate effect cannot but be harmful to the telegraphers as a class. Already some of the roads having adopted the telephone as a substitute for the telegraph in the handling of trains, their officers wonder why they were so long in discovering its advantages.

Other roads are falling into line and it is safe to say that within a very few years the telephone will be in service by all the roads for such purposes of communication as it requires. When this becomes the universal practice, the offices now manned by telegraphers will then be in charge of young men or young women employed in their home town and who may be put to work after a coaching of but a few days and many of the skilled telegraphers will then be relegated to the scrap pile of "has-beens."

Does it argue for the good of the telegraphers that the telephone which may be operated by anyone is rapidly being installed; that printing telegraphers are being perfected and put into service and that the best thinkers along these lines are working much more than nine hours a day in an effort to devise some means of getting away from the aggressiveness of a class of employes who consider the interests of the railroads as secondary to their obligation to the order they represent?

The railroads under existing methods are necessarily obliged to secure their agents and train dispatchers from the telegraphers, and from such employes higher officers heretofore have been selected. If a departure from such methods in the use of other devices—which now seems more than probable—is made, will not the personnel be strengthened

by a selection more desirable, generally better qualified and more reliable and a new class of employes evolved whose individuality is not stifled by their allegiance to a false god?

Mr. Daly: I would move, Mr. President, that we take a recess of five minutes, and reassemble in Executive Session for the discussion of Mr. Chenery's paper.

This motion being duly seconded, was carried.

And the open session thereafter adjourned.

THIRD SESSION.

Thursday, June 25th, 1908.

The meeting was called to order at 2:15 P. M., the President, Mr. E. P. Griffith, being in the chair.

The President: Gentlemen, we have a big afternoon's work before us, and several important papers to be presented, so we will have to devote our entire time and attention to getting through the programme laid out.

The order of business calls for the resuming of our papers. The first paper to be presented this afternoon is a short history of the Association of Railway Telegraph Superintendents, by Mr. W. F. Williams, Seaboard Air Line Railway.

I will call upon Mr. Williams to read his paper.

Mr. William's paper is as follows:

THE ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS, ITS PAST, PRESENT AND FUTURE.

By W. F. Williams.

In assigning to me this topic for a paper, your committee has given me such a wide scope that much I would like to say must be sacrificed to brevity. They surely must have mistaken my powers, supposing me to be at once, historian,

recorder and prophet. However, it is given us all to learn the past; the present is ours; and it does not require the wisdom of a seer to read the horoscope of an organization whose watchword is "Go Forward."

Having had the honor and pleasure of membership with this delightful and profitable body but twelve of the twenty-seven years of its existence, I can speak of its early history only as I have gathered data from different sources.

In 1882, several railroad Superintendents of Telegraph happened to meet in the office of Col. R. C. Clowry in Chicago. During a discussion of matters of mutual interest, Mr. W. K. Morley, of the Chicago & Alton R. R., suggested the formation of an Association, and on November 20, 1882, a meeting was held in Chicago, at the Grand Pacific Hotel, at which Mr. Morley was elected President, William Kline, Vice-President, and C. S. Jones, Secretary. Committees were appointed to draft a constitution and a form of service card.

The second meeting was held at the same place, June 13-14, 1883, at which the roll showed forty-three members, representing thirty railroads. At this meeting, Mr. Morley was re-elected President and Mr. P. W. Drew, Secretary. How long, and how ably, and how pleasantly the latter has served in this capacity, we all know. Physicians say "A man is as old as his arteries." I have recently read with much interest, that D'Arsonval, a celebrated French experimenter, has invented an apparatus to prevent the incroachment of age. By applying a high frequency current of electricity, with vibrations as high as one hundred millions per second, the walls of the arteries are kept from hardening and the blood, finding no resistance, speeds on its round giving health and life and youth—a veritable Ponce de Leon having been discovered. I am sure I voice the sentiment of each and every member of this organization, when I suggest

that our first duty is to see that our beloved Secretary is at once made the object of this wonderful rejuvenator, and in the event one application does not bring the desired result, we give him two, so that paraphrasing a well known couplet, we may say of him:

“Men may come and men may go,
But Drew goes on forever.”

The third annual meeting was held in Philadelphia, Sept. 17, 1884. The records of each succeeding meeting show that interest never flaged. This coming together proved such a well-spring of thought, that the membership increased, each one eager to profit by the mutual interchange of experience and observation. Manufacturers began to take note of these gatherings and knowing the inquisitive character of these men searching for the latest and best inventions to assist them in their work, decided that in one respect at least, they were all “From Missouri,” and at the 6th meeting in Boston, June 1887, the first exhibits of telegraph and other electrical devices were introduced, and this has proved a most interesting feature. Recognizing the value of this innovation, the constitution of the Association has been so amended as to permit manufacturers or their representatives to become associate members.

Meetings have been held in various states, from Canada to Louisiana and from New York to Colorado. The one held in Wilmington, N. C., May 1899, was made memorable by the fact that we had as our guest of honor, Thomas A. Edison, the greatest inventor of the age.

The Silver Anniversary was held in Denver, June, 1906, and the last meeting, in Atlantic City, still so fresh in our minds, brings us to the present time. The projectors of this movement “builded wiser than the knew.” Our latest information places the total railway mileage in the United States, January 1908, at approximately 230,000 miles of line.

The membership of this organization represents 175,000 miles or 76% of the whole. There are eleven systems, representing 11,450 miles, which have Superintendents of Telegraph, who have not identified themselves with us. The remainder, or 63,550 miles, is made up of small lines, varying from 3 to 1900 miles with no Telegraph Superintendent. These figures speak for themselves. No more eloquent tribute could be paid to the popularity and value of our Association, and no more foreful evidence of the alertness of the men having in charge the telegraph interest of the various railroads they represent and their determination to keep in the front rank and up to date in all that pertains to the betterment of the service.

The history of the Association shows steady advancement in every way. The papers presented and topics discussed, have been of wide range and practical good has been evolved in these recitals of knowledge wrought out of the experiments, tests and trials of every day life. The quality of the discussions clearly reveals wide research and diligent investigation, a determination to get at the root of things. And so today we stand with problems old and new before us. In the field of electricity developments follow in such quick succession that one point is but fairly settled when another more important and far reaching confronts us. The secular press tells us that a Frenchman has invented a little machine which will enable a man in New York to see what is going on in Paris. A Danish inventor is credited with having solved the problem of transmitting a photograph by wireless. A scientist in Portland, Oregon, has invented the "Teleone", which enables parties conversing over the telephone to see each other. None of these are more improbable than others which have been fully demonstrated and are now in daily use. One of the most vital issues before us today, is dispatching trains by telephone,

a proposition which in the early history of our meetings would have brought a smile to the lips of the most credulous. But the handwriting is on the wall, the practical working of this admirable scheme has become an accomplished fact—and facts like fire make people move. I predict that the next decade will see a marvellous revolution along this line. Would not the “Teleone” be an additional safeguard?

So the future looms before us big with possibilities, weighted with responsibilities. We must work, study, experiment and together thrash out the knotty problems as they come to us, realizing that on us rests the upbuilding of the branch of railroad service entrusted to our care. Nothing “succeeds like success”, and this Association has been an unqualified success. What it has been it will be. The personnel is composed of men who are conscientious, honest and earnest—who appreciate the opportunity afforded them by these annual reunions, for absorbing the best thoughts of men who are daily meeting and mastering the complex conditions which arise in the administration of the duties which devolve upon them.

I cannot close without saying that no agency has been so helpful, no source of information so fruitful to me in my daily life, as the meetings of this Association. When to this is added the charm of its social feature, I feel that it is indeed a privilege to be “one of the boys”. In the language of Rip Van Winkle, “May you live long and prosper.”

The President: I wish to thank Mr. Williams personally, and on behalf of the Association for his very interesting paper. There are a good many of the younger members of this organization who, perhaps, have nothing more than a very hazy idea of its history. I am sure we are all pleased to see the history of our Association dealt with in such an able manner as Mr. Williams has dealt with it.

I am pleased to see that we have with us today the second

President of this Association, Mr. Morley, the first President, having served two terms, and, I am going to call upon Mr. Selden to say a few words to us, as one of the oldest members (not necessarily in years, but in length of service) of the Association of Railway Telegraph Superintendents.

Mr. Selden: Mr. President and Gentlemen: I hardly know what I can say to add to the very able paper just read by Mr. Williams, but, perhaps, to go a little behind what Mr. Williams has said I might tell you that Mr. Morley and I met on a train one day, and it come out in the course of the conversation that he had hired a man who had just been discharged from the Wabash, and I had just hired a man who had been discharged from the Alton Company. I was then Superintendent of the Wabash Lines for about three months. I said to Mr. Morley "don't you think it would be a good thing for us if we had an Association, or some arrangement for communication between Superintendents. He said he thought it would be a good idea, and added, "Go ahead and get it up." I said, "Just take hold of the thing, and if we persist in it, we can get just exactly what we want, eventually.

The result of our conversation was that the first meeting was called at the Pacific Hotel.

In the beginning we were not looked upon very favorably. There seemed to be an impression that we were going to start a little bit of a pleasure organization of our own, and probably swap contract secrets. Eventually it was found that that was not the case, and those who had looked with disfavor upon the Association came to believe in its utility.

I have been in other Associations, and I have visited a great many of them, but I never saw one, or never belonged to one wherein there was so much time and attention

given to the work and to the advancement of the affairs of the Association, as there has been in the American Association of Railway Telegraph Superintendents.

I can say, as I look back through a great many years of the service of the telegraph, that this Association has been to me a very great source of pride and I would much rather belong to it than to any other organization I know of.

I served this Association as President, and I thought at that time that being President of the American Association of Railway Telegraph Superintendents was almost as great an honor as being President of the United States.

I do not know of anything more I can say which would be of interest to you, except that this Association has largely tended to advance the consideration with which the Superintendents of Telegraph are now regarded by the other officials of the Railways. It is true that in the advancements which are being made the necessity has been greater than they have realized (although we were some time in getting to that stage) for such an Association—they have come to realize that there was an absolute necessity for such an organization, just as much, in fact, as there was for such an Official as a Superintendent of Telegraph. They know that the Superintendent of Telegraph, in order to maintain his position, must keep abreast of the time, and be ready at all times, to answer questions in regard to every new development in the management of the Railways, as far as the Telegraph is concerned.

I am very pleased indeed to see this meeting so largely attended, and I hope as we go along from year to year that we shall become stronger and more necessary than ever in our particular lines, and that our membership will increase steadily, until we become a power in the land.

Mr. Rhoads: Mr. President, inasmuch as we have with

us today practically the first President of our Association, we may overlook the fact that we also have with us a gentleman who even antedates the first President. We have here with us today the Chairman of the first meeting held before they organized and elected the first President.

I have much pleasure in suggesting that Mr. Kline of the Lake Shore and Michigan Southern, the First Chairman of the First Committee of this Association, should say a few words to us on this occasion.

Mr. Kline: I agree with what Mr. Selden has said entirely. As he told you we met at the Grand Pacific Hotel, and I think I was the first Chairman of the Board, as it was then.

After that, I left for several years, and did not meet them. However, I kept track of what these gentlemen were doing. This is the second time I have been to a meeting in over ten years, but I have kept in touch with everything that has been done, and I am very glad to see that the younger generation have grown up and have tried to stimulate the work of the Association. They are a brave, good looking lot of fellows, and I feel sure that they are going to make their mark in the world, just the same as the old fellows who preceded them.

I wish you, both individually and as an Association, all success in whatever you may attempt, and I will be very glad indeed to do anything I possibly can to assist you, in any way.

The President: It might be as well for me to announce at this time that this particular meeting has been very successful in every sense of the word.

In the number of new members elected, we have beaten all records. At this meeting we have taken in no less than twenty-five active members, and sixteen Associate members

—more than three times the number that met in the Grand Pacific Hotel in 1882. This shows that a great oak has grown from the tiny acorn planted in the Grand Pacific twenty-seven years ago.

The next item on our programme is the reading of a paper by Mr. C. S. Rhodes, entitled “Qualifying Operators for Train Dispatching”.

This is a most interesting subject, and, one which I am sure will be thoroughly and ably dealt with by my friend, Mr. Rhoads.

Mr. Rhoads paper is as follows:

QUALIFYING OPERATORS FOR TRAIN DISPATCHING.

By C. S. Rhoads.

When we come to consider that about 90 per cent. of young men make failures of their chosen vocations it is easy to see that only the fact of the individual being the sole sufferer thereby is all that prevents the above mentioned startling condition from causing serious disorder in our complex business fabric. Relatively few of this 90 per cent. are Train Dispatchers, but just for a moment consider what a failure means in their profession, any one of numberless oversights or careless risks and mistakes may distribute the suffering to dozens and even hundreds of people who may never even know the name of the man whose failure at this chosen profession has involved them.

If qualifying an operator for this important position consisted merely in having him become conversant with the Standard Code, our task would be an easy one, but the work of the Train Dispatcher is such that to be successful, in the true sense of the word, he must be an extremely resourceful individual, with many and varied attributes that go to make safe service. Some one has said that “Wisdom is

knowing what to do next" and "skill is knowing how to do it." So our first duty in looking for material is to find the fellow who at least has the first of these attributes, that is, one who is not satisfied with what he is doing as an operator only, but has ambition to become a Train Dispatcher, and is wise enough to take advantage of every item that fits him for his calling.

Our next duty consists of aiding him to become skillful. He should be able to send good Morse and to receive good bad and indifferent, and to be put up to date, hereafter, must cultivate a telephone voice, as the Dispatcher of the future will no doubt 'phone his orders, hence, clear pronunciation, minus stammering will be a necessary requisite. He should first have good experience at a way station, becoming familiar with all the little details of station work, including not only the agent and operator's portion, but that of the train men, then when he has earned his promotion to the Dispatcher's office he will have a knowledge of things thus gained which gives him an advantage over the man who has not had the benefit of the station training, the more training he has in this direction the sooner he should be qualified for Dispatcher after entering the Dispatcher's office, and the time of probation there, in addition to his natural ability for the work, consists largely of the opportunity he has to observe and familiarize himself with the Dispatcher's work, preferable he should act as copier for a Dispatcher, in that capacity he not only has the better chance to become qualified but the Dispatcher has an opportunity to try him out, and if himself, properly qualified as a teacher, is soon able to pass judgment as to the applicant's adaptability and fitness for promotion.

Yet, with the advent of the short working hours for operators, one can find time to put in some spare hours each day, if he is a wise aspirant, for a larger usefulness, in

keeping up train sheet for the Dispatcher, and in going out on the road becoming thoroughly familiar with the trials and tribulations of the train men and in knowing the location of every switch and siding, in fact nowhere is a complete knowledge of every detail so important an element as applied to this service. When we come to try to enumerate the items that constitute all the elements that stand for success in train dispatching, we are apt to frighten possible candidates by the apparent multiplicity of duties required to meet the demands of the position. But it is just this underlying fact that every applicant should understand in the beginning, and our duty is to see that they have that idea thoroughly instilled into them, and that "a little knowledge is a dangerous thing", in connection with Dispatcher's work; and in examining operators for promotion a full and complete knowledge of every factor of safety, including what might be termed only precautionary items, should be required. While some may argue that a person is not at his best until after he has made a few mistakes, we must urge that Dispatcher's work be the exception, if that is to be the rule, and certainly no operator should be approved for promotion whose record does not imply that in all cases of doubt or uncertainty he will take the safe course and run no risks.

The President: Mr. Rhoads' paper is now open for discussion.

Mr. Rhoads: Before the discussion begins I would like to enquire how many gentlemen there are here who have been train dispatchers, or who are dispatchers at the present time?

(About fifteen of the members present indicate that they have been trains dispatchers, or are at present engaged as such).

Mr. Rhoads: I would like to know also how many of you gentlemen present, have, as a portion of your numerous duties, the work of examining the operators on the rules for train dispatchers?

(Three of the members present indicate that they have the duty of examining operators on the rules for train dispatchers).

Mr. Selden: Mr. Rhoads has just asked if there was any one present whose duty it was to examine operators for dispatching. I would like to know if there is any one present who has, as part of his duty, to examine the dispatchers?

Mr. Rhoads: That was partly included in my question.

Mr. Selden: It is the custom, two or three times during the year on each division of our road, to select, at random, the books of the dispatchers, and see wherein he has violated the rules. All the work of every man who works a trick is gone over for that purpose, and a report is made to the General Manager, and also to the Superintendent of the Division.

Mr. Rhoads: I might just add a word in reference to our work in that direction. For a great many years the Superintendent of Telegraph (owing to his having numerous duties, and possibly on account of his eminent qualifications) has been detailed to have charge of the examination of dispatchers, and operators for promotion to dispatchers, in order to see that the rules were understood alike on all divisions.

In doing that the idea is to have the Superintendent and the Train Master and the Chief Dispatcher present, if possible. However, within the past two years, owing to Legislation, largely in one or two of the States, they thought best to pay more attention to examining the operators who

were on the block system. In order to do this they made a selection of an experienced telegraph man, Mr. E. R. Bonnell, (who was elected a member of our Association yesterday), giving him the title of Supervisor of Train Dispatching and Block Signals. One of his duties, in connection with the examination of operators, would be that of handling the Block signalling work, and following up the dispatcher's work, both in their offices, and out on the division. From time to time he goes into the offices and finds out if the forms of the orders, and all the details of the work are being complied with.

We found that his work has been followed by excellent results, and the dispatchers are now kept on the lookout, because they know there is a man who is looking after them, and who will want to know why they are doing anything which is not strictly in accordance with the rule. For instance, if they want to annul an order, and call out "Bust such an order," they are liable to get a letter from the Superintendent enquiring why they have done so.

The Supervisor reports to the Division Superintendents in regard to things which happen on their divisions, and may, in certain cases, send a copy of his letter to the General Superintendent.

Mr. Camp: On the Canadian Pacific we have officers known as "Inspectors of Train Dispatching." Our line is divided into two grand subdivisions, under the names of Eastern Lines and Western Lines. We have present with us today the two Inspectors who look after those divisions—Mr. Hatton and Mr. Rooke.

I would ask Mr. Hatton to give the members present the benefit of his experience.

Mr. Hatton: On the Western lines of the C. P. R. the Dispatchers are generally selected by the Superintendent.

or by the Chief Dispatcher. In selecting these Dispatchers they generally take into consideration a man's ability as an operator, and they also estimate as far as they can, what his judgment is concerning train movement, etc. His past record is also taken into consideration.

These men are examined by the Chief Dispatcher and the Inspector of Transportation on the Western Lines. I have the honor of filling that latter position myself.

It is the duty of Inspector of Transportation to visit the several Dispatching Offices as frequently as possible, probably about once a month, and to see that a uniform system of dispatching is maintained, and that the Standard rules are observed. Any mistakes that he finds in the office are taken up direct with the Train Dispatchers, and the Inspector also reports direct to the General Manager, who takes the matter up with the General Superintendent.

Of course, we always point out to the Train Dispatcher on the spot, anything which we find wrong, and he rectifies it at the time.

We have special rules in addition to the Standard rules, which we expect to be lived up to; and, where we find that they do not observe those special rules, we take it up with them, and they have to account for themselves.

Mr. Rooke: I do not know that I can add anything to what has already been said, that in the matter of choosing Train Dispatchers, on the Eastern Lines we follow the practice of having certain offices where our best operators work; that is at divisional points and terminal points, where the bulk of the work centres on them. In that way they are peculiarly fitted for the position of Train Dispatchers when their turn comes.

In connection with what has been said about a copier, I would like to ask what is the practice on the different

roads? The copier writes the orders out as the Dispatcher sends them. In a repetition is the copier responsible or is the Dispatcher responsible?

Mr. Selden: On the B. and O. the Dispatcher is responsible. He sends the order and is responsible for it.

Mr. Rhoads: After changing the administration of our road, the General Manager (who had not been a Train Dispatcher) voted that the copier was an unnecessary luxury, and that it would be best, in holding the Dispatchers responsible, to have them copy their own orders. Possibly five years ago the last of the copiers were done away with.

I grew out of a Dispatcher's office myself, as a copier, and I always rather fancy (perhaps owing to that fact) that it gives an operator in the Dispatcher's office a chance to demonstrate his ability, and the Dispatcher in the office a much better chance to find out whether he is a proper man or not.

As it is now and as it has been those past few years, sometimes you have an operator go into the Dispatcher's office, and he sits at a table during his allotted time, and he may stay there for a year or more, and never hear a train order sent. He really has no chance to fit himself, unless he comes around after hours to do so. He is no better off than he was out on the road.

Mr. Ryder: There has not been a copier on the Burlington as far as I can remember. For my own satisfaction I would like to know how general the work of having copying operators obtains. With the permission of our worthy President, I would like the members present to tell me how many roads there are where copying operators are employed.

(Three of the members present indicate that copying operators are employed on their roads).

Mr. Selden: I may say that on our line we tried the copiers a couple of years ago in a very busy office; but the trial only lasted two days. We did not like it, and rather than have the copiers, we placed two or three men in the Dispatcher's office to assist them in making out reports, etc., but there was not enough to be done, and we dropped the idea of copying.

I may say, also, in connection with selecting operators for Dispatchers, that we usually place them in the Dispatcher's office where they can get more thoroughly accustomed to the work. When we cannot place them in the Dispatcher's office, we put them in terminal offices.

Mr. Jackson: I would like to ask what you consider a fair day's work for a Dispatcher who has no copier, and whether you take the sheets off his hands, or whether he has to copy his own orders, and look after them part of the day, and perhaps part of the night?

What I want to know is about how many orders in the usual course, would you consider a fair day's work for a man working without a copier?

Mr. Rhoads: It is very hard to answer that question. We have had Dispatchers where there were two hundred orders given in the twenty-four hours. Of course, that would be an eight hour trick. Some portions of the day it would be a little livelier than others. I could not state just what the maximum or minimum would be.

However, a Dispatcher is figuring on what he is going to do, and sometimes has several different things in mind at one time. When he is sending an order, of course, he sends it out of his head, and as the first operator repeats it, he copies the order, whereas, if you have a copier, he puts the order down, which gives the Dispatcher a little more time to figure on other more important work.

Having grown up with that way of handling orders in the Dispatcher's office, and having watched it since, without a copier, I still feel at times as though it would be a good arrangement to have the copier back. Our road has never considered it favorably so far.

Mr. Van Etten: I have worked on roads with copiers and we finally came to such a state that we did not consider it necessary to have them. The copier was not in the habit of working as a Dispatcher, but he kept watch on the Dispatcher.

Mr. McFarlane: We have one district where the dispatching is very heavy. We have Dispatchers who handle from eighty to one hundred and twenty orders on a single trick. We have Chief Dispatchers both night and day in those offices. Those trick Dispatchers, however, look after the ordinary movement of trains, but a general outline for the work is taken up and arranged for by the Chief Dispatcher.

We have no copiers on any portion of the road..

Mr. Camp: It seems to me, Mr. President, that if we are going to adopt the telephone dispatching altogether, the question will resolve itself into one of no copiers. The Dispatcher will naturally drop into writing his order as he transmits it.

Secretary Drew: I notice that the paper written by Mr. Jacoby, entitled "Depot Wiring from the Contractor's Standpoint" is in the hands of the Chairman of the Topics Committee, Mr. Davis. The Chairman of the Topics Committee is, however, unfortunately detained by an important business matter which suddenly arose. He told me just before the meeting opened, that he could not be here for an hour or so. I think under the circumstances that we had better suspend the reading of Mr. Jacoby's paper until Mr. Davis is present.

Mr. Foley's paper on "Moving Trains by Visible Signals" is not yet completed, but he has arranged with the Chairman of the Topics Committee to send me the paper in time to be printed in the Minutes. I do not suppose there will be any objection to that.

Mr. William Maver's paper on "Developments in Wireless Telegraphy" will be read tomorrow, when Mr. Maver will be here.

This leaves nothing in the way of papers before us now. It would be perfectly right and proper if we were to proceed with selecting the next place of meeting, and the election of officers.

The President: Inasmuch as we have a very good attendance of active members just now, it seems to me that this would be a good time to do as our Secretary suggests.

If there is no objection we will proceed with the selection of the place for our next annual meeting.

The Secretary has some invitations which he will read to you, but of course, you understand it does not necessarily follow that we must select a place simply because we have an invitation from it.

I may say that I think in reaching your conclusion you should bear in mind the fact that a central point is most desirable. You all know that many of us can ill afford to spend more than two and one half or three days in reaching the point of meeting and returning. I believe that we would have a better attendance if we selected a central point, and I hope that you gentleman will decide on a place which will be in the best interests of the Association, irrespective of invitations or inducements from other places.

Mr. Selden: I quite agree with what you have said, Mr. Chairman. I also think that it is not necessary to take into consideration the districts of the Officials, whoever you may

select. It seems to me that we should endeavor to meet in a central point.

Now, there are a number of places which will probably be suggested, but I would suggest one, which I think would be very satisfactory to everybody.

I, therefore, move that the next meeting of this Association be held in the City of Detroit, Michigan.

Mr. Dyer: I have been requested by the Chamber of Commerce, the Association of Merchants, the Mayor of Los Angeles, and several prominent individuals and members of Organizations to extend to this Convention a hearty invitation to hold its next Annual Session in the City of Los Angeles, California.

I do not desire to urge the matter if it will interfere in any way with the attendance at the meeting. However, I would like to call your attention to the fact that, so far, this Association has not seen fit to hold a meeting west of Denver, Colorado. Many of the members have not had an opportunity of seeing how we carry on our business in the West—they have not seen the country, and do not know our telegraph system—nor have they had an opportunity of visiting the most beautiful part of North America.

Aside from its many attractions as a pleasure place, the members of this Association and their ladies, will have an opportunity, not only of visiting Los Angeles, but also of visiting Pasadena, San Bernardino, San Gabriel, and seven or eight other places famous the world over.

Many of the members of this Association must, for business reasons or other reasons, make the attendance at the annual Convention also their annual outing; therefore, it seems to me that the City of Los Angeles should be considered.

We have there, one hundred first-class hotels which will take care of a lot of members, and, if there are too many for those hotels we have a great number at Pasadena and other places.

You will have an opportunity of visiting the orange groves, and the ostrich farms—you will have an opportunity of seeing Jim Jeffries, and one or two other luxuries.

Many of the members, no doubt, have visited Southern California, and know that it is a most beautiful country. The sight of our tropical plants, orange groves, and so forth would be very interesting indeed to those of you who have never seen anything of that kind.

Owing to the fact that this Association has never gone west of Denver, I think it ought to be an additional reason for you to consider Los Angeles favorably this time.

The Mayor of the City, and those different Associations and Organizations cordially extend an invitation to you to visit them; and, I assure you personally that you will all have a good time.

There are different places where we can hold our meetings. In fact, it could be arranged that we would move from day to day, and hold the different Sessions at different places.

As a matter of information, I might say that during the month of May we have in the City of Los Angeles, we have what is called the Annual Festa, which is a most gorgeous affair. It is a flower parade, one of the remnants of the old Spanish period.

As an additional attraction we will also have the Exposition at Seattle, which will be open.

The time between Chicago and Los Angeles is four days. Between St. Louis and Los Angeles is four days. Between

El Paso and Los Angeles is three days. Los Angeles may be reached either by the Northern Routes or Southern Routes, and those who may desire to visit Portland can do so either from the South or from the North.

The fact that it is a long way to Los Angeles should not act as a reason against your going there now, because I think it would be an education in itself for many of the members to go.

We have an invitation from the best Organizations and people of the City, and, as I say, you will have a good time and will be able to take care of your business at the same time.

The President: I notice that a few of our members have came in since this question came up. For their information I would say that we are now discussing the place of our next meeting. So far there have been two suggestions. Detroit and Los Angeles.

Mr. Dyer: I would move that Los Angeles be selected as the place for our next meeting.

Secretary Drew: As I read you this morning, we have an invitation from Goderich, Ontario.

We also have the usual standing invitation from the Organizations, Business Men's League, etc., of Niagara Falls.

Our friends in Atlantic City have sent us an invitation to go back there again next year.

Mr. Rhoads: Mr. Chairman, a central point mentioned as being probably the best place for us to meet is in accordance with my ideas.

While I fail to bear any invitation from any of our Commercial bodies, I would like to mention Indianapolis as a

place where the latch string is always out. They claim there that they have more Conventions than any City in our land.

Since this Association met there a few years ago we have added to our Park lines, and we hope that when you come again you will take time to go through the parks. We also have Fort Benjamin Harrison, a new Government Army Post, which has been made into a very beautiful place, and if you come to Indianapolis, I can safely guarantee to give you a good time.

Mr. Davis: I did not hear the first part of Mr. Dyer's remarks, and I was just wondering if he omitted to say something which he certainly should have said, and that is in connection with the temperature.

He told me that the weather there is very delightful about this season of the year, and that the people slept, last Tuesday night, under the same covering as they did in January. That is very comfortable and delightful, and I, for one, hope that we will decide to go to Los Angeles this year.

The President: If there are no other suggestions I think it would be as well for us to put the matter to a vote. This is a matter in which only active members have the right to vote.

Those in favor of Los Angeles will please rise so that we can count them.

(The vote resulted in fifteen members voting in favor of Los Angeles, and twenty-four against).

The President: I regret that we cannot take advantage of the beautiful climate of Los Angeles. I have been there myself, and know exactly what we are missing. However, I do think that it is a trifle too far away for a successful meeting. Personally I would have been very pleased to go to Los Angeles.

We will now vote for Detroit, as the place of our next annual meeting.

(Detroit was then unanimously decided upon as the place for the next annual meeting).

Mr. Camp: I think I am speaking for the Association generally when I say that we would have been very glad to go to Los Angeles if it were not for the distance.

The President: Now that we have decided the place of our next annual meeting, the next order of business is the election of officers. The first officer to be elected for the coming year is the President.

Mr. Van Etten: Mr. President, I have much pleasure in moving that Mr. W. J. Camp be elected President of this Association for the ensuing year.

This motion was duly seconded by Mr. C. S. Rhoads, and carried unanimously, amid applause, the Secretary being instructed to cast one ballot for Mr. Camp as President of the Association.

Mr. Camp: I do not think you have made a very good selection, gentlemen. There are several members here who would fill this position much better than I can, in fact, I had in mind one or two gentlemen whom I thought should have been elected to this high office.

Mr. Griffith: I don't think we have made any mistake—in fact, I am sure we have not.

We will now proceed with the election of a Vice-President.

Mr. Selden: I wish to present for the consideration of the Convention the name of a gentleman who I believe will strengthen and help our position. He is connected with one of the largest Railroads in the United States, and is a bright, intelligent, nice, good fellow. I have much pleasure

in nominating Mr. J. B. Fisher, of the Pennsylvania Road, as Vice-President of this Association for the coming year.

Mr. Taylor: I have much pleasure in seconding the nomination of Mr. Fisher.

Mr. Rhoads: I would like to nominate Mr. G. W. Dailey of the Chicago and North Western.

Mr. Williams: I second Mr. Dailey's nomination.

The President: Seeing that we are to have an election for Vice-President, I will appoint the "Long" and the "Short" of it as Scrutineers, Messrs. Ryder and Foley.

(The result of the balloting was, Mr. G. W. Dailey received 31 votes, Mr. J. B. Fisher receiving 14).

Mr. Selden: I move that the nomination be made unanimous, and that the Secretary be authorized to cast one ballot electing Mr. G. W. Dailey as Vice-President of this Association.

The motion was duly seconded by Mr. C. S. Rhoads, and carried, the Secretary then cast a ballot in favor of Mr. G. W. Dailey, as Vice-President of the Association.

The President: We have had the long and the short of it as scrutineers. I am now going to ask the "Wide" of it to escort our newly elected President to the Chair. Will Mr. Dyer kindly perform?

Mr. Dyer thereupon escorted President-elect Camp to the Chair amid prolonged applause.

Mr. Dyer: Gentlemen of the Association, I have much pleasure in introducing to you the new President of this Association. I guess most of you know him pretty well, so he does not need much of an introduction. I am also under the impression that he knows most of you fellows pretty well too.

President Camp: Gentlemen, I hardly know what to say on being placed in this position. You rather take me by surprise, and put me in the condition of being practically speechless.

I thank you very heartily for the honor you have done me in electing me President of this Association. I know you could have made a much better choice, but seeing that you have now done the damage, I can only say that I shall endeavor to fulfill whatever duties may devolve upon me to the best of my ability, and that I shall be prepared at all times to render whatever assistance I can to the Association of Railway Telegraph Superintendents.

As we have considerable work to do, I am not going to detain you with any speech making. You all know my ability in that line is very limited.

As President, I now say that we will proceed to business.

Mr. Selden: If it is in order, I would like to vary a little from our usual procedure in the election of another officer, and I would move that the Secretary be authorized to cast a ballot for the election of Mr. P. W. Drew as Secretary of the Association for the coming year.

This motion was duly seconded by Mr. Chenery.

President Camp: It has been moved and seconded that our Secretary be authorized to cast a ballot for the reelection of Mr. P. W. Drew, as Secretary-Treasurer for the coming year. What is your pleasure in regard to that motion?

(The motion is carried unanimously, amid applause, and Mr. P. W. Drew is declared elected Secretary for the year 1909).

Mr. Drew: I thank you very much gentlemen for this mark of continued confidence in me.

The position of Secretary, as you all know, is one that requires a good deal of patience, and as I have advanced in years, I have learned to become more and more patient.

There is one thing that stands in the way of getting our Minutes out more promptly, and that is the fact that we can never print them unless we get sufficient advertisements to pay for them.

Now, the advertisers are sometimes slow in responding to our solicitations for ads. I have been circulating among our friends, and have secured quite a few so far, so that I do not anticipate a great deal of delay on that score.

As you all know we do not have sufficient money to print our minutes and pay for them without advertising. That is what we have to work for, and the more advertising we need the greater the work to get it. We will endeavor to get our books out just as soon as we get the advertisements ready. There is another point upon which I would like to touch, very delicately, and that is that there are some members of this Association who are a trifle slow in paying their dues—so much so, that even after soliciting them two or three times, sometimes we do not get the returns from them. Although the by-laws say that if a man does not pay his dues within a specified time he is liable to be struck from the roll of membership. We never like to do that, however, because it has been our experience that members who have been delinquent for two or three years, come right around sometimes and pay up everything they owe.

It is a great honor to me to be Secretary of an Association of this kind, even with all the work, and all the worry and all the trials and all the tribulations attached to it.

I am very glad indeed to act as your Secretary, and I thank you most heartily for having re-elected me this year.

Mr. Selden: I recollect sometime ago that there was an

agreement that each member should have a copy of the proceedings, or may be two copies. After that there was a price put upon the extra copies that might be called for. Will you kindly inform me what we are entitled to in the way of copies of the minutes, and what is the price for extra copies.

The Secretary: There are two copies of the Minutes mailed to each member of the Association, both Active and Associate. The advertisers get six copies each. Extra copies of the books are sold at a price varying according to the size of the book and its cost.

We have sold a good many books for twenty-five cents each, but these books cost us nearly one dollar each. Of course, we have not asked that, because we know we would not get it. The price of the extra books would be between twenty-five cents and thirty-five cents, depending upon the size of the book.

This year, I may say, that our Minutes will fill a book pretty nearly as large as last year. Under those circumstances, extra copies would be sold for thirty-five cents.

The President: Gentlemen, I have an announcement to make, which I feel sure will please some of you.

I stated, when I presented my report as Chairman of the Committee on Arrangements, that on account of it being against the rules of the C. P. R. to issue passes for sleeping car accommodation, you would have to pay your own sleeping car accommodation from here to Quebec and return.

I have just been advised by Mr. Kent that he has arranged that there will be no charge for the sleepers on the trip.

The President: We have a paper on our list entitled "Depot Wiring from the Contractor's Standpoint", by Mr. J. H. Jacoby, Electrical Engineer and Contractor.

South Bethlehem, Pa. Mr. Davis has the paper in his possession, and will read it.

Mr. Davis: As Chairman of the Topics Committee, I asked Mr. Jacoby to prepare a paper on this subject. He has been very busy, I understand, and has not been able to be present. He has forwarded the paper to me with a letter of explanation in which he says:

"I have been exceedingly busy, which led me to postpone the matter of taking up paper on topic assigned to me, but I have finished it and forwarded it direct to place of meeting, in care of Mr. Drew, thinking that he would be most likely to be on hand.

"I do not know whether this paper will meet your idea of the subject matter, but I have endeavored to do the best under the circumstances. I trust it may prove of some benefit to the meeting, and that you may have a very successful convention.

"I regret my inability to be with you; nothing would afford me more pleasure than to meet the many friends, and take advantage of the very interesting discussions, as they no doubt will prove, from the list of subjects and papers which has been sent me."

With best regards, I am,

Yours truly,

J. H. JACOBY.

Mr. Davis then read Mr. Jacoby's paper, as follows:

DEPOT WIRING FROM THE CONTRACTORS' STAND-POINT.

The electrical contractor may have views differing somewhat from those of others who have in charge the erection of a depot or other building; it would appear but natural that he should be inclined to recommend all the various up-

to-date appliances and a liberal distribution of them throughout the building as well as ample provision for maximum amount of lighting. Whereas the builder, generally being of an economical trend, especially in the matter of electrical equipment, would not be so liberally disposed. It shall be my aim to give some good reasons for the contractors' position in this matter, and to show that a saving in first cost of a plant may prove much more expensive in the end, as well as in the matter of running expenses or fixed charges. However, I am afraid in the limited time I feel myself confined to by reason of the numerous papers to be read before this Convention, it will be somewhat difficult to do justice to the subject.

I do not know that I have fully caught the intent of the Topic Committee as to what particular phase of the subject they had in mind when they assigned it, but have concluded that inasmuch as the the Rules and Regulations of the National Board of Fire Underwriters have been within the reach of all, and you no doubt are conversant with them, that the engineering feature might be the more profitable. However, it may not be amiss to refer incidentally to some phases at least of these rules and note as we pass along, the great strides the electrical profession has taken with reference to wiring, during the several years past.

That the contractor should be an engineer as well, I think goes without saying, although it will be noted that in most cases he simply has to follow the plans and specifications handed him; however, suggestions or recommendations for improvement from him are frequently taken in the proper spirit and add much to the electrical profession, if intelligently made.

In wiring a depot, I presume, all will agree that the first and foremost consideration is that of safety. Yet with all

the frightful disregard of the simplest electrical law, noted in the wiring of many buildings it must be said that very few fires have resulted from this source, and I would here remark that if the most ordinary precautions are taken and the rules fairly well complied with, there is hardly a possibility of fire, and from a number of years of experience in this particular field I am persuaded that electricity is the safest illuminant known.

The Underwriters' Rules, already referred to, differ somewhat in the various districts, in some of the details, but generally they are a unit on essentials and it may be said that these rules having been compiled from all the varied experiences and mishaps of the past, are as near perfection as any body of men specializing along certain lines, can make them.

One of the differences it might be well to note at this point, is the adoption of certain insulated wire for concealed work. Some Districts require rubber covering, others fire and weather proof. My preference would be the latter for the reason that the insulation is more durable. After a few years the rubber covering becomes in a manner soft and flimsy, while insulation of the fire and weather proof wire hardens and becomes more tenacious with age. In rewiring buildings this fact has been particularly noted by the writer as well as by others who confirm the statement. Yet it cannot be said that there is any particular element of danger in the use of rubber covered wire, for were it not for the fact that through some misplacement of a wire by a wireman touching some metal or other substance thereby forming an arc, the bare copper wire might be strung concealed throughout a building with perfect safety—the porcelain insulators affording all the necessary protection.

The safest system, without doubt, is the iron conduit,

either flexible or rigid, with probably a slight advantage in the latter, from the fact that it is almost impossible for any workman in locating steam or water pipes, or any other changes or alterations made after wiring, to injure the wires secured within, besides in case of any future trouble the defective conductor may be withdrawn and a new one inserted at short notice without any inconvenience and at very slight cost. However, it is contended that no potentials higher than 250 volts should be carried concealed into a building; until recently the popular 500 volt D. C. for motor service was permitted, when each of the two wires of the circuit was placed in a separate pipe and when wires were lead encased; but this was found to be bad practice leading to various troubles and dangerous to property. The placing of both wires in one pipe and securely grounding all the pipes throughout the building is considered much better, but even this is not recommended. I should say that if it is found absolutely necessary to take them in concealed, secure a high grade insulated, Duplex, lead incased, and place in iron conduit, grounding the latter securely.

It might be of interest to note here that an attempt at securing this result was made some few years ago, in the use of what was then termed, paper conduit, which was constructed of a paper fibre coated inside and out with a pitch or tar preparation, answering the purpose of withdrawing the old and inserting new wire, very well as long as no nails were driven into it, but with this feature thrown in, the wire could only not be pulled out, but an electric arc developed, setting fire to the building. This has actually occurred and it was not long in use before it was placed under the ban by the Board of Fire Underwriters. Several cases of this kind came within my personal experience. When this paper conduit was first placed on the market, two large depots in cities along the line of the road, were

under construction, and a gang of men were placed in my charge for piping and wiring them. This conduit was placed with great care and precision and all the wires afterwards pulled in. It was pronounced an up-to-date job and all went well for the space of twelve years or more, when suddenly through some alternations made by a carpenter on one of the floors of one of the stations, a short circuit developed and a fire started. Luckily it was discovered and put out before much damage was done. The other so far as I know is still intact and working all right.

The twin conductor, flexible steel armored wire, while approved and doubtless safe, has the unfavorable feature of difficulty in removing, should a short circuit or ground develop—such trouble is quite possible, in fact has several times occurred recently, to the writer's knowledge.

Ordinarily, what is known as knob and tube work whereby the wires are secured along timbers by means of porcelain knobs and through timbers by porcelain tubes or bushings a safe distance apart so that no wire of opposite polarity can possibly get together, may be regarded as entirely safe so long as no grounds or crosses are produced by workmen on the building afterwards; the wires being entirely concealed there is no means for locating them when holes are drilled for gas, water or other pipes, besides in the average depot building there are numerous outlets in or near brick walls where it is not considered proper to use other than iron or steel armored protection, so that it would appear far preferable to have a complete and uniform conduit job.

It all classes of wiring, whether concealed or open, (and I would not draw the line on electric light work, but include wiring of every sort), the joints should be carefully soldered before taping. This is very important and cannot be too strongly emphasized.

The second consideration doubtless is the lighting effect, and this means plenty of light with proper distribution and location of outlets. Here the architect figures largely if not entirely, and it is suggested that he consult the contracting engineer, which is sometimes done, in order to reach the best results. For beauty and attractiveness the lighting effect can scarcely be ignored. A depot may be decorated and furnished in the most lavish manner, yet if improperly lighted will lose much of its lustre and beauty and the saving thus effected prove a false economy. Lighting outlets with proper fixtures should be carefully located with due regard for height of ceiling and area to be covered, as well as the room furnishings. Every avenue, passageway, corner and nook should receive its proportion of light, eliminating all dark and gloomy spots.

The economical side of depot wiring is frequently placed first on the list by reason of the fact that appropriations are lacking and in scalding down, the electrical equipment is the first to suffer. Switches or other controlling devices are omitted and an insufficient number of circuits provided. All of which will tend to increase the running expense. Be liberal with your switches or controlling devices, divide up the circuits into such combinations as will meet the lighting requirements for different hours of the night, being careful to locate such switches conveniently so that the attendants can readily operate them and there will be a marked saving in current bills, and in case of an isolated plant, in fuel and renewals, paying a large percentage on the additional investment. The rule should be to make it just as easy as possible to control lights and combinations of lights throughout the building.

I have only treated briefly the question of electric light wiring, the other wiring, such as telephone, telegraph, fire alarm and power circuits, should also be carefully planned.

providing shafts, ducts and passageways for all such wires, so that at any time in the future, changes can be made without defacing the building or displaying unsightly cables and wires. This in former years was sorely neglected, but of late more attention has been paid to the matter with highly beneficial results. In entering a depot plans should be made for underground service. In making this recommendation I am aware of the fact that there are a number who oppose this, preferring overhead work, but it has been satisfactorily demonstrated that underground construction can be made perfectly secure and reliable, and while, perhaps, somewhat more expensive at first cost, will undoubtedly prove a saving in the end, and then it is so much neater.

In presenting this brief paper I have not attempted anything new, but it is hoped that some of the suggestions may lead to a profitable discussion by the members of the Association.

Respectfully,

J. H. JACOBY.

Mr. Selden: In connection with this paper I would like to say that about a year and a half ago, the B. and O., through their architect's department, determined that all new stations, whether large or small, should be provided with two underground conduits, one for electric light, and one for telegraph and telephone service, and that all reconstructions of old buildings amounting to anything worth speaking of should be similarly equipped.

It might be well for the members of this Association to bear that in mind. It is something which does not cost very much. The conduit may be made either of iron pipe, or terra cotta. We have had a number of stations wired in that way, and the result has been very satisfactory.

You know what it is to put in a nice little station, if

you do not afford facilities of this kind the electric light people will come along and string their wires anywhere. They will stick porcelain insulators under the eaves of the building and get their wires in any old way. There is nothing that so disfigures a building as an unsightly lot of wires running into it.

Mr. Chenery: Do I understand that that idea prevails anywhere except on the B. and O?

The President: I think we have been more or less neglectful in the past, in regard to the manner in which we enter our stations, and other buildings with our wires.

The C. P. R. Company is a confirmed offender, in this respect. Of late years, however, we have used throughout our whole system aerial cables for this purpose. The great trouble we find is in going underground into a nice new station, or putting in a neat aerial cable, the telephone company or the electric light company, will come along and stick up their wires anywhere, absolutely destroying the effect of any attempt at neatness which you have made.

Mr. Taylor: I would like to ask Mr. Selden what kind of cable he uses in the underground work. Is it lead covered cable?

Mr. Selden: Lead covered cable, and where the Railway Company furnishes it, we have wires twisted and laid out in pairs.

Mr. Taylor: Do you notice any more trouble than usual in these cables?

Mr. Selden: We do not. They are generally well insulated.

Mr. Taylor: Do you protect them with lightning arresters?

Mr. Selden: On the whole, yes.

The President: Here in Montreal the Canadian Pacific Railway Company has an underground system from the Windsor Station to our Commercial Telegraph Office. We have not had any great difficulty from lightning, or in fact anything else, since we installed that system, which is about six years ago now. All wires, in our belief, should be underground.

We protect our wires outside with lightning arrestors on the poles.

Mr. Chenery: I would like to ask Mr. Selden how he gets into his buildings with electric light wiring, if the wiring is not in accordance with the specifications of the Electric Light Companies of the smaller towns.

Mr. Selden: I have not a copy of our specification. That is handled entirely by the Architect's Department. We have a regularly organized Architect's Department, and all those matters are provided for and taken care of. We do not have any trouble whatever.

I really think it is a deplorable thing to ride along a railroad and find a nice new station all plastered over with black unsightly wires.

We take a great deal of trouble to get our wires across the tracks in a neat way, but we do not seem to bother about our station. How many of us have seen nice new stations erected, and, have come back three or four months afterwards and found the appearance of the station absolutely destroyed by those wires, which have been allowed to straggle in, in any old way.

The cost of putting down a small amount of this concrete does not amount to anything, comparatively speaking, and it leaves the station clear and neat, and allows it to show up well, instead of having a lot of ugly, straggling wires.

Mr. Church: Do you think it necessary in the use of short aerial cables, say from 40 feet up to 200 feet in length, that there should be a protector of some kind, or lightning arresters of some kind.

Mr. Selden: Well, in many instances where we have a short run of cable we have one protector out on the pole, to protect it. We do this to protect the building, rather than to protect the wires.

In some cases where we have a great number of wires, and especially where we have a long circuit, we generally have those protectors or lightning arresters on the pole. Ordinarily the connection is inside.

Mr. Van Aken: Are we to understand that there are fuses on the office pole as well as lightning arresters?

Mr. Selden: We use fuse on the office pole where we have a large number of wires, and where we can arrange the pole conveniently for them.

Ordinarily, I may say, we use the fuses in the office. I have gone into the matter pretty carefully, and I do not know of any office where we have lost anything by lightning. Once in a while, I suppose, we meet with accidents, but they do not generally amount to much.

For the benefit of the Association I may say that within the last few years the plans for every depot or station on the B. & O. are submitted to the Superintendent of Telegraphs for his approval on the wiring situation. The Superintendent of Telegraphs has to approve of the provisions made for the wiring of a station before the work proceeds.

We are just about finishing a fine terminal at Wheeling, with a cement viaduct probably a thousand feet long. In making that bridge they made the conduits right in it, both for the lighting and for the telegraph.

The B. & O. building at Baltimore (of course that is a building which we were constructing with a view to providing for the future) is provided with a system of wiring which is so arranged that you cannot put a desk anywhere on the floor but what would connect with wires immediately underneath it. We can connect a desk in any part of that building with the wires underneath, without taking up the carpets, linoleum or anything else.

This is worked on a rather peculiar system perhaps. It was an experiment, you might say, in the beginning. The theory was that we would make a lot of outlet boxes about eight feet apart, and string the wires across between them. There was hardly a space of five feet between two sets of wires.

We arranged the circuit channels on each floor transversely every ten feet or so, and then crossing them, we had lateral channels at slightly wider distances. The result of this is that you can put a desk anywhere on the floor and by going down under it, you will strike it within the area of the desk. I may say that we even went so far as to have our desks made with hollow legs so that the wires could come up through them without being seen.

We have in that building one hundred and forty desks, and we can move them about anywhere we like without taking up a carpet.

The way that is worked is this: There is an outlet on the base-board, and then there is another on the picture rail. These are coupled together by a cable about three-quarters of an inch in diameter. When we want to make a connection for a telegraph or telephone, we take the diaphragm of an ordinary telephone, and taking another telephone connect it with the circuit. The man who is making the connection holds one of these diaphragms to his ear and goes

along on the floor. The moment he comes near the channel there is a click in the telephone, and he locates the channel without the slightest difficulty. He then opens the fibre of the carpet with a round stick, and bores a hole in the floor and gets his wire up.

It was supposed that this would be very expensive, but as a matter of fact we have saved one hundred and sixty-six dollars on each floor of the thirteen floors of the building, and we never had to show a wire anywhere, nor have we ever had to cut a wall.

President Camp: With reference to the question propounded by Mr. Van Aken a few minutes ago, I might say that on the C. P. R. every connection of aerial cables entering a station is provided with a lightning arrester inside the station, either with or without fuses, if the protection is on the outside. It may happen that in case of a fuse being used only, your fuse connection with ground blows out, if a thunderstorm comes along during the night, and it interrupts your system and there would be no means of recovering it until you could get a man there by the next train, so that for aerial cables we use Kerite usually, instead of lead covered, and we do not place any protection on the pole.

So far, I don't think we have had a case of a station cable being injured by lightning. I do not remember of one any way. We consider it better to lose a cable than to have our wires interrupted frequently by lightning discharges during the night.

Mr. Chenery: As the hour is getting late, I would move that we now adjourn until tomorrow morning at 10 o'clock.

The motion being duly seconded by Mr. Davis, is carried.

FOURTH SESSION.

Friday, June 26th, 1908.

The session was called to order at 10:20 A. M., the President, Mr. W. J. Camp, being in the Chair. In opening the proceedings the President said:

I had intended to call this meeting to order sharp at 10 o'clock, as was understood yesterday afternoon, so that we could get through as early as possible, but, I had to go to the station in order to make some further arrangements about our sleeping car accommodation for tonight. Then I had so many interviews after getting back that it was impossible for me to open the session earlier.

I understand that the Secretary has some communications which he wishes to make before we proceed with the regular order of business.

Secretary Drew: I have a telegram from Denver, Colorado, addressed to me as Secretary of this Association. It reads as follows: "Hearty congratulations from Denver and the Rocky Mountains, one mile high, and everything dry. (Signed) C. A. Parker, J. M. Walker."

I also have a telegram from Mr. Groce, dated New York, June 25th: "An unusual turn of affairs has made it necessary for me to cancel my arrangements for attending the Montreal meeting. I regret this very much, and shall appreciate it if you will give this information to my friends who are so fortunate as to be able to attend. The Committee of which I am Chairman has not held regular meetings during the past year on account of existing conditions well known to all members of the Association. The prospects for accomplishing some beneficial results in the near future are good, and I shall be glad to lend my efforts to gain the desired results. Jennings, one of the other members

of the committee, joins me in this report. I hope you will have an enjoyable and profitable meeting."

The President: We have one paper to be read this morning, entitled "Developments in Wireless Telegraphy," by Mr. William Maver, Jr. I will call upon Mr. Maver to present his paper.

Mr. Maver's paper is as follows:

DEVELOPMENT IN WIRELESS TELEGRAPHY.

By William Maver, Jr.

Wireless Telegraphy is not altogether a new art. Over ten years ago Sir Wm. H. Preece, in England, succeeded in transmitting speech without wires between the Skerries Lightship and the mainland of Anglesey, a distance of three miles across water. This was accomplished by the use of parallel wires stretched on poles along the shore of the island and the mainland. A telephone transmitter on one wire set up magnetic waves that were received by a telephone receiver in the other parallel wire. It was assumed in this experiment—It is more than an experiment however, for the arrangement has been for years, and still is in practical operation—that magnetic induction through the air and electric conduction through the water assisted in the transmission of speech.

Another type of wireless telephony is that in which variations in the luminosity of a beam of light are caused to reproduce speech at a distance. This device, which in some measure, is analogous to the latest developments of wireless telephony by electro-magnetic waves, is due to Alexander Graham Bell, the inventor of the telephone.

In the operation of this device, Bell caused a ray of light to fall upon a small concave mirror carried on the center of a suitable diaphragm at the end of a mouthpiece. From

this mirror the ray was reflected as a parallel beam of light, and fell upon a distant parabolic reflector, in the focus of which reflector was placed a selenium cell. It is well known that the electrical resistance of selenium varies in accordance with variations of light to which it may be subjected. This selenium cell is made a part of a circuit containing a telephone receiver and a small battery. When the reflected light from the mirror falls on the selenium cell it takes on a certain resistance and a steady current flows in the circuit, depending on the amount of the resistance. When, however, sounds are spoken into the mouthpiece of the transmitter, the vibrations of the mirror on the diaphragm cause variations in the luminosity of the beam of light and these variations in turn affect the selenium cell causing variations in its resistance, and consequently variations in the current strength of the circuit, which react upon the telephone receiver and reproduce speech very clearly. But the distance to which speech has been transmitted by this device is rather short—about 300 or 400 feet.

Subsequently, Simon of Germany, discovered that if the resistance of the circuit of an arc light be disturbed by the introduction of a telephone transmitter in the circuit, the arc itself will reproduce speech spoken into the transmitter. The assumed explanation of this phenomenon is that it is due to rapid variations of the volume of the vapor of the arc caused by the variations of the current strength due to the vibrations of the transmitter when spoken into; the corresponding variations in the vapor of the arc setting up sound waves in the air. This is termed the speaking arc phenomenon. The following further explanation of or analogy to this phenomenon may be offered. The explanation of a thunder clap is that it is due to the rapid expansion and contraction of the air due to the lightning discharge. Analogously, we may consider the effect of the microphone trans-

mitter upon the arc to be the production of minute changes of temperature in the arc that in turn cause condensations and rarefactions of the surrounding air corresponding to sound waves which we may regard as miniature thunder claps and which, occurring as they do in response to the vibrations of the transmitter, due to the voice, are recognized by us as articulate speech.

Following Simon's discovery, Bell and Hayes found that the electric arc itself could be used as a transmitter of speech. Their method consists in placing the arc light in the center of a parabolic reflector. A telephone transmitter placed across the terminals of the arc light causes variations in its light which, although not visible to the eye, can be detected by a suitable detector in the focus of a parabolic reflector; this in turn reproducing speech in a telephone receiver. (Described at length in author's "Wireless Telegraphy").

This idea was advanced a long step by Mr. E. Ruhmer, of Berlin, who utilized a sensitive selenium cell in the center of the receiving parabolic reflector and succeeded in transmitting speech due to the variations (caused by a microphone transmitter) in the intensity of a search light, to a distance of about 10 miles. Some of the selenium cells used by Ruhmer have a resistance in the dark of about 25000 ohms, which drops to about 1500 ohms in the light.

In all of these systems of wireless telephony it will be observed that speech is transmitted by modifying the ether waves that constitute light. Systems of this kind, however successful they might be in actual operation, would obviously be limited as to distance of transmission by the actual distance at which light is visible under the best atmospheric condition, about 30 miles, and in times of fog and thick weather, this distance would be largely reduced.

Early workers in this field quickly recognized that if it were feasible to modify the electro-magnetic waves used

in wireless telegraphy, a wireless telephone system might be developed that would be operative at distances, perhaps, approximating to that of wireless telegraphy, and that would not be limited in its operation by smoke, fog or other somewhat similar atmospheric conditions.

But the difficulty in thus utilizing electric waves has been that the waves set up by the spark in wireless telegraphy are highly intermittent and are very quickly damped. Assume, for example, that an alternating current generator or the interrupter of an induction coil, giving an alternating current of, say, 80 cycles per second, is employed as the source of current supply in wireless telegraph. These alternations, by charging the oscillator circuit, may give rise to a frequency of, say, 800,000 cycles per second in the aerial wire. Unfortunately, however, owing to the damping of the oscillations, due to heat loss and the loss due to radiating energy in the shape of electric waves, these oscillations die out very rapidly and last for only a very small fraction of a second, and in consequence of this effect there is a comparatively long interval between the spark discharges (nearly $\frac{1}{60}$ th of a second) during which time no electric waves are radiated. In wireless telegraphy these pauses or breaks, or rather the beginnings of the new discharges, are observable in the telephone receiver as a tone or buzz which is broken into dots and dashes by the Morse key. Therefore, inasmuch as many of the tones, or overtones, that compose articulate speech consist of vibrations of 5000 to 8000 per second, it is clear that many of these tones would be lost during the pause between the spark discharges, which, of course, would conduce to inarticulate speech. Furthermore, obviously the noises in the telephone, due to the intermittent nature of the spark discharges, would prevent the successful transmission of speech.

To obviate this difficulty, a number of inventors have

directed their energies toward the design of a machine generator that would deliver a smooth alternating current of very high frequency, but until somewhat recently, not with very marked success, the irregularity of the machines making the reception of speech difficult. Mr. Fessenden has lately devised a machine generator giving an output of 2 volts and a frequency of 80,000 cycles per second at a speed of 8340 revolutions per minute. With this machine as the source of current supply, Mr. Fessenden reports that he has succeeded in transmitting speech between Long Island and Brent Rock (near Boston), a distance of about 200 miles.

Another method entirely different from the machine method, of obtaining sustained oscillations, is that due to Mr. Duddell's discovery of the singing arc. The principle of this discovery is that when an arc lamp, fed by a direct current of about 250 volts, is shunted with a suitable capacity, and an inductance, alternating currents of a frequency of 40000 per second are established in the shunt circuit. Mr. Duddell's explanation of this phenomenon is that at the moment when the shunt circuit is completed a current flows from the arc into the condenser circuit which decreases the current flowing in the arc. This causes an increase in the difference of potential between the terminals of the arc, causing still more current to flow in the condenser circuit and raising its potential above the normal voltage of the arc. In consequence the condenser begins to discharge back into the arc increasing the current in the arc and reducing the potential difference between its terminals. The condenser now discharges too much and the reverse process is set up and sustained or continuous oscillations are in this way maintained in the shunt circuit.

Owing to the comparatively high frequency and the smoothness of these sustained oscillations the telephone re-

ceiver will not, by reason of its electrical inertia, respond to them. Hence, if sustained oscillations, whether generated by a machine or by the arc, are to be utilized in wireless telegraphy some method of breaking the continuity of the waves has to be adopted, practically as, in certain other telegraph systems, a continuous current is broken by a buzzer and is heard in the telephone as a tone. Furthermore, while the telephone will not respond to the high frequency continuous oscillations of the Duddell arc, if the amplitude of the oscillations be varied to a degree that comes within range of the receptivity of the telephone receiver, as, for example, by speaking into a microphone transmitter placed in the aerial or in the oscillation circuit, the telephone receiver will respond and reproduce the speech spoken at the transmitter, practically as speech is reproduced by varying the amplitude of the waves of a beam of light in the cases mentioned.

So long, however, as the oscillations of the singing arc were limited to about 40000 per second, but little practical use could be made of it owing chiefly to the weak magnetic effects at comparatively low frequencies, and the consequent inability to radiate wave energy of much power. Fortunately, it was discovered by Poulsen, the inventor of the telegraphone, that if the singing arc is placed in an atmosphere of hydrogen or other gas of high heat conducting qualities, the frequency of the oscillations are increased to a remarkable degree, namely, in some cases to 500,000 cycles, per second and over. It was also found that by burning the arc in nitrogen gas, compressed air or in steam, the frequency of the arc oscillator is much increased. The flame from an alcohol lamp placed under the arc also has this effect.

The electrodes of the oscillating arc consist of a solid carbon (negative) and a copper tube (positive). The cop-

per electrode is cooled by a stream of water passing through it; Poulsen having found that this cooling of the metal electrode increases the efficiency of the arc as a generator of oscillations. The capacity used in some experimental installations is quite small, being about .02 microfarads, but information as to the exact proportions of capacity and inductance employed in practice are not at present procurable. The arc requires for its proper operation in producing oscillations in the shunt circuit, a current of certain strength and a certain length of arc. For instance, Poulsen has found that with a difference of potential of 220 volts at the arc it ceases to set up oscillations when the current falls below six amperes, with a water cooled positive electrode, or below four amperes with a non-cooled electrode.

The discovery of the oscillating arc opened the way for the use of these sustained oscillations in wireless telephony, and Poulsen and the Telefunken Wireless Company, in Europe, and De Forest in this country, have made considerable progress in telephoning to a distance by modifications of this arrangement of the singing arc.

When the oscillating arc is employed the inductance is made part of a transformer, the secondary of which is in the aerial wire circuit. De Forest modifies the oscillations by placing a microphone transmitter directly in the aerial wire. Poulsen modifies the oscillations by means of a microphone transmitter inductively connected with the supply or feed circuit of the arc. Fessenden modifies the oscillations set up by the machine generator by means of a microphone transmitter in the generator circuit: the generator and transmitter being connected in the aerial circuit.

A detector, such as is employed in wireless telegraphy, is availed of in wireless telephony. Fessenden and Poulsen use the electrolytic, or liquid barreter, or a thermo electric

couple as detectors, while De Forest utilizes the audion, all in combination, of course, with a telephone receiver in a local circuit. While quite a number of United States war ships have been equipped with De Forest telephone apparatus, definite reports concerning the operation thereof are not yet at hand.

The Telefunken Company in Germany, experimenting with wireless telephony, employ the singing arc burning in air with a water cooled copper electrode. It having been found that with the arc burning in air the frequency of the oscillations is increased by putting a number of arcs in series, the Telefunken Company place six of the arcs in series on a 220 volt supply circuit, and 12 arcs on a 440 volt supply circuit.

Reports of these experiments place the speaking distances at about 25 miles. These and other experimenters in wireless telephony in which the arc oscillator is employed, indicate that considerable difficulty is met with in maintaining a uniform tone of the voice in the telephone; the words being received in alternately low and high tones, rendering speech indistinct and very hard to understand. This is doubtless due to irregularities in the operation of the arc.

In connection with the wireless telephone experiments thus far made by Mr. Fessenden, between Brent Rock, Mass., and a station in the vicinity of New York City, it is reported that speech has been transmitted with an expenditure of only 200 volts, less than one-third of a horse-power. On this basis Mr. Fessenden concludes that with a mast 600 feet high and a an expenditure of ten volts it will be possible to telephone between America and Europe without wires.

It may be noted that Mr. Fessenden has in operation a wireless duplex telephone system in which he employs an

inductance and capacity to balance, as in wire telegraphy, but, of course, no resistance.

A great advantage to be obtained by sustained oscillations, both in wireless telegraphy and telephony, is that the property of resonance may be more fully availed of than with more or less intermittent oscillations. In some respects, however, perhaps, sustained oscillations and the better resonance gained thereby may be of more utility for wireless telegraph purposes than wireless telephony, especially as regards increased distance of transmission. This appears obvious if it be considered that in both wireless telegraphy and wireless telephony the receiving apparatus is practically the same. In wireless telegraphy, however, the full effect of the radiated waves from maximum to zero is available, whereas only a comparatively small portion of the received wave energy, namely the modifications of the wave energy due to the action of the microphone transmitter, (about five per cent. of the total energy, it has been estimated), is available in wireless telephony. Improvements in the direction of more powerful transmitters whereby a large percentage of variations in the amplitude of the waves may be obtained, are now to be looked for. It is stated that Fessenden expects to perfect a transmitter capable of producing a variation of twenty-five or fifty per cent.

As the writer remarked in the opening words of his paper on Wireless Telegraphy, read before the Association last year, "wireless telephony, if only available for a comparatively short distance, obviously could be installed to advantage in the officer's room of every ship that floats ocean, lake, river or harbor," because of the fact that it requires no specially trained operator. But it was, of course, assumed that the apparatus would be considerably less complicated than that in use in wireless telegraphy. At present

this is not the case, and the amount of expertness necessary to properly manipulate the present apparatus is, no doubt, beyond that now possessed by the ordinary ship's officer.

Still, wireless telephony may now be said to have arrived at a point of practical utility, although, of course, as previously intimated, it is still susceptible of much improvement in many directions.

Telephoning without wires has the advantage over wire or cable telephony that it does not have to contend with the static capacity of the conductor. When, therefore, the necessary improvements in this art have been made it is, perhaps, not beyond bounds to expect that the claims now made by certain enthusiastic inventors, as to Trans-Atlantic Wireless Telephony, and which in some quarters are considered visionary, may be ultimately realized.

The President: Hardly a session of this Association passes but we have something of great interest from Mr. Maver. He has indeed been very kind to the Association in this regard, and on behalf of the Association I thank him most heartily for his able and most interesting paper.

Mr. Maver's paper is now open for discussion.

Mr. Davis: As Chairman of the Topics Committee, I wish to express my very sincere thanks to Mr. Maver for his most excellent paper, and I can assure him that it is most heartily appreciated.

Mr. Maver: I thank you Mr. President and gentlemen.

The President: I suppose Mr. Maver has covered pretty nearly everything in his paper, so apparently it does not leave us very little room for discussion. This as about the usual procedure with Mr. Maver's papers.

Mr. Davis: I think probably the reason why there are no remarks on Mr. Maver's papers is because it is too deep for us.

Secretary Drew: One of the great benefits of the papers presented by Mr. Maver is, that they are a little out of our direct line, and give us something slightly different from our direct business thought. It broadens our minds to have a man like Mr. Maver come in and give us something in a technical way about things in which we are all, of course, interested, but about which we are not as well posted as we ought to be. Another advantage is that by studying these papers if our general managers come to us some time and say, "Well, what do you know about Wireless Telephony?" for instance, we are in a position to tell something about it. This is information which cannot be acquired by studying books or anything of that kind. It must be acquired through hearing some expert like Mr. Maver give practically a lecture on the subject.

I think we certainly owe Mr. Maver a debt of gratitude, and ought to thank him sincerely for what he has done for us in this particular line. I am sure we are all very glad to have Mr. Maver with us at our meetings, and to have him contribute something to our minutes each year.

Mr. Taylor: I would like to ask Mr. Maver what there is with reference to interference in the case of wireless telephony?

Mr. Maver: Well, of course the same rule applies in a measure, to wireless telephony, as applies to wireless telegraphy. That is to say the sustained oscillations and tuning is made very sharp and well defined, so that a circuit tuned to a certain rate of oscillation will not respond to any other unless it comes within the prescribed rate of percentage of oscillation to which it is tuned. In that way, interference is avoided to a very large extent.

One of the features or advantages of sustained oscillations is that you can make very close tuning.

Mr. Taylor: As I understand Mr. Maver, it would be possible, or at least it would seem to be possible that if wireless telephony is developed, you could maintain a distinction on the oscillations or tuning, and avoid interference?

Mr. Maver: That is the point, in a general way. Of course, that is something which practice will have to determine. Fessenden and other workers in wireless telephony claim that several hundred different rates of oscillation can be maintained, not one of which will interfere with any other.

Mr. Rhoads: Bearing on the point that Mr. Taylor brought up I may say that when the system was developed in the navy, they had a great many problems in that line of work. They had several sets of wireless telegraph instruments on the ship Brooklyn, and there were also several wireless telephone sets. I am informed that they are working on an arrangement whereby five different telephone messages can be simultaneously sent without interference with one another, or without interference from the wireless telegraph. I understand they have been fairly successful in doing this. Of course this is merely a start but it shows what they are doing in that direction.

Mr. Foley: Dr. De Forrest made some experiments between our terminal at Hoboken and the ferry boats moving in the river, with very good results. He is now establishing communication between our Hoboken terminal and 23rd street, a distance of about two miles.

Mr. Millington: I suppose that the wireless telephone will be more successful over the sea than over the land, the same as the wireless telegraph?

Mr. Maver: I think so, for long distances at least.

President Camp: If there are no other remarks in connection with this paper I will declare the discussion closed.

That completes our list of papers as submitted by the Topics Committee. Is there any other business before the meeting.

Mr. Millington: If it is not out of order, or in conflict in any manner with the ordinary rules of our proceedings, it seems to me that now having listened to this very interesting paper that this would be an opportunity to have what we have not had at this convention. This is an age of progression when the atmosphere is being mastered by air-ships (some of them propelled by the hot air method), I think we are entitled to at least one more oratorical flight.

I recall the fact that yesterday afternoon we elected a Vice-President, who was absent at the time entertaining the ladies. This gentleman has spent a good deal of time burning midnight oil preparing his speech of acceptance of the high office to which we elected him, and now that he is present I think this is the psychological moment to hear from our Vice-President elect.

The President: I intended to call on Mr. Dailey to explain how he got out of the way yesterday. Will Mr. Dailey please come forward and let us hear some of his silver tongued oratory?

Mr. Dailey: My friend, Mr. Millington, to the contrary notwithstanding, I have to say that I did not burn any midnight oil preparing a speech of acceptance. I was too tired when I got back after my efforts of yesterday.

Yesterday afternoon, in my absence, you did me the honor of electing me Vice-President of this organization, and when I got back from a very pleasant trip I received a very pleasant surprise.

This is an honor which I appreciate very much, and one

which I know our road will appreciate very much. I did not think I would be called upon to make any speech, but just as soon as I came in, Brother Millington, with his usual promptness and forcibleness, spotted me and called me out, long before I was prepared to say anything.

As for oratorical flights, I don't know very much about it, although I believe a railroad official nowadays has to be a lawyer, an orator, a grafter, and a man of sound common sense.

The President: Did I understand you to say that he had to be a lawyer, or is it possible that you mean he has to be a liar?

Mr. Dailey: He has to be a little of both.

I do not know that I can say anything more to you except to repeat that I appreciate the honor you have done me very much, and shall do all in my power to deserve it, and to further the interests of the Association as much as I possibly can.

There is one thing which has been in my mind for a long time, and that is, I honestly think there is just as much brains and ability stored up in the heads of the Telegraph Superintendents as in the heads of any Superintendents connected with the railroad, and I do not see why this organization should not become just as strong, and just as important as the Signalling Association, for instance, or the Engineering Association, or any of the other associations of railroad officials. If we work together, and pull together, I think that probably we will reach that stage some day in the not very distant future, and the railroads will be very glad to have us meet and exchange ideas, knowing that it will be to the ultimate benefit of the road.

Mr. Millington took me entirely by surprise, and I must disappoint him in regard to the flights of oratory.

As I said before, I will do my best, and will help our President in any way I possibly can. If he calls upon me, I will endeavor to do my best for the benefit and welfare of the Association, in order to bring it to the state which we all fondly hope it will some day occupy.

The Secretary: For the benefit of some of our recently elected members, I would like to say that we have two sections which meet about once every three months. The western section holds its meetings in Mr. Dailey's office, which is on the 15th floor of a fine building owned by the North western. We get around there at those quarterly meetings and have an interesting session, then Mr. Dailey and some of his railroad officials invite us in and we have a nice little lunch in their dining room.

Mr. Dailey: I would like to extend the same courtesies and the same invitation to any of the visiting brothers from the East any time they happen to be in the vicinity of the North Western Railway.

Mr. Taylor: I would like to know the dividing point between the Eastern and Western Sections, referred to by our Secretary?

Secretary Drew: We rather accept it that any road that runs into the central time limit is in the Western Division; the Eastern roads are supposed to take from Buffalo to Pittsburg and down the line east and south. It is not an arbitrary division, by any means. Any man from New York would be gladly welcomed in the Western Section if he happens to be there; and I am very sure that if I happen to be in New York or Philadelphia or wherever the meeting was held, I would feel that I was at liberty to attend.

We do not want it understood that this dividing line is arbitrary at all, because that is not the fact. The place which is most convenient for any man to go is the place where he is welcome.

Mr. Selden: The Eastern Committee meets at Baltimore, and we are always glad to see any of the members from the Western Section or from any where else. We also furnish lunch. Further than this, I would say that our latch string is not always out, because the door is always open.

Mr. Van Etten: The point is to get some kind of a notice. I would have been glad to attend the meeting in Chicago, but I did not receive any notice that I know of. I did not know anything about it, until a friend of mine was talking to me on the train coming in.

I am glad the matter has come up so that some arrangement can be made with reference to notifying the members.

Mr. Chenery: I must confess, that, perhaps I am responsible for not having notified the gentlemen. There was no defined distinction as to who would go to the Western Meeting, or who would go to the Eastern Meeting.

As our Secretary has said, the Eastern Division was presumed to be composed of those members who represent roads which run east of the Central Time Limit. I know when sending out notices I have picked out mostly those gentlemen who had made some enquiries about our Western Association, or whom I thought would be able to attend.

We have had those meetings in the west for years. I think our Annual Meeting at Atlantic City last year was the first time that any mention was made of such a division. It was then decided that we would have two divisions, one in the East and one in the West. Perhaps we are advanced far enough now to outline some definite action.

If that Committee is to be continued for the next year, we will probably come before you and arrange to hold Meetings at the same place, perhaps, or at least on the same day of the month.

The President: I think it would be as well for us to let

that matter stand, until we come to deal with the report of the Committee.

I wish to say that one of the points of satisfaction to me when I was elected President of this Association, was the fact that you elected Mr. Dailey as my assistant. As you all know I have not any oratorical powers, and I will rely upon Mr. Dailey to supply my deficiency in that respect. I know that in all other respects I can count on his most hearty co-operation.

Mr. Rooke: If I am not out of order, I would like to ask, as a matter of information, how many miles of single track is being operated on the roads which have adopted the telephone for handling trains.

The President: Can Mr. Ryder supply the information?

Mr. Ryder: I have not the information at the moment, but I should imagine the different members could give, approximately, the information asked for.

On the Burlington we have at present in actual operation about 225 miles of single track.

Mr. Foley: The Lackawanna has forty.

Mr. Van Etten: I understand that the Illinois Central has 100, or is about to put in about 100.

The President: The C. P. R. has their only circuit so far on single track.

Mr. Millington: The Michigan Central has full authorization for the construction of about 185 miles of single track, to be completed inside of about six weeks or two months.

Mr. Dailey: The North Western has eighty miles of single track in operation, and 120 miles under construction, and 200 miles authorized.

The President: We have a Committee on "Pole Construction, to withstand Sleet and Wind Storms." This Committee consists of Mr. William Maver, Jr., M. C. H. Bristol, and Mr. F. F. Fowle. The only member of the Committee present is Mr. Maver.

Have you any report to make Mr. Maver?

Mr. Maver: The Committee was not able to do anything owing to the conditions.

The Secretary: You will remember that the Committee sent us a very elaborate request for a great deal of very valuable information, but this request came just at the time when we were having so much trouble in regard to the eight and nine hour law. I do not think any Superintendent could have taken the time required to give all the information which the Committee desired in order to formulate its report. I wrote Mr. Maver telling him that I did not believe he could do anything in that line, just at that time. We were all so much occupied with this other matter that we did not have the time to attend to it.

Now, whether we should go on for another year or not is something which I do not know. It seems to me, Mr. President, that most of us are bound down by the rules of the Telegraph Companies in regard to construction, and I think it would be almost a waste of time for us to try to get up any scheme for constructing lines outside of their requirements in their contracts with Railway Companies.

Under the circumstances I would move that the Committee be discharged.

Mr. Selden: I second the motion.

(The motion being duly put to the Meeting, was carried).

The President: The next Committee to report is the "Committee to Formulate Method and Confer with General Managers' Association". The members of that Committee

are E. P. Griffith, W. W. Ryder, C. S. Rhoads, G. H. Groce, and C. Selden. They are all present with the exception of Mr. Groce. Mr. Griffith is the Chairman of the Committee. I understand that he has a report to present.

Mr. Rhoads: Mr. Griffith has been called out for a few moments, and he asked me to say for him, as Chairman of the Committee that the conditions changed so rapidly following the date of the last Meeting, that the object of the appointment of the Committee solved itself, and the General Managers have rapidly been converted to the telephone idea. This left the Committee with really nothing to report, other than the fact that the matter had been taken care of by the rapid making of history.

I move that the Committee be discharged.

(This motion being duly seconded by Mr. Ryder, was carried).

Mr. Van Etten: In selecting the place of meeting yesterday, we did not name any date. I would, therefore, move that the Meeting be held June 23rd, 24th, and 25th. Those dates bring us in the same week, and the same days as the present meeting.

The President: It has been moved by Mr. Van Etten, seconded by Mr. Davis, that our next Annual Meeting be held June 23rd, 24th, and 25th, 1909.

The motion was declared carried unanimously.

The President: We will now have the report of the Committee on "Matter of Record". The members of that Committee are Messrs. Hope, Davis and Cellar. Mr. Hope is absent, but Messrs. Cellar and Davis are present. Has the Committee anything to report?

Mr. Davis: I have had a blank handed me by the Secretary just a moment ago, and I think all the members (especially those who were present at the Meeting in Atlan-

tic City) know what the object of sending that out was. It was for the purpose of formulating everything that could be used by the rialroads in showing the actual amount of time consumed by the operators at each of the Stations in doing certain kinds of work.

Speaking for the Chicago and Eastern Illinois, I would say that the blank as prepared by the Committee was used, and we followed out the wording of this blank and its intention right to the letter; with the result that when the data was taken over to Washington we could show just exactly what amount of time was consumed by every one of the operators in every one of the offices in different kinds of work.

I believe nearly all the Railroads did the same thing.

Although we did not gain our point there, we have the satisfaction of knowing that the Chairman of the Interstate Commerce Commission said that we had put them up against a very hard proposition, and made their work very difficult.

Although we did not win our point, I do not think the effort was wasted by any means.

I considered that the work of the Committee has been done, and that there is nothing further for it to do. I would, therefore, move that the Committee be dismissed.

(This motion was duly seconded by Mr. Williams, and carried).

The President: We now come to the reports of the Sub-Committees on Quarterly Meetings. We will first hear the report of the Eastern Sub-Committee, composed of Messrs. Selden, Foley and Taylor.

Mr. Selden: We held but one Meeting, and only had matters of a Legislative character before us, consequently the report could only be made in Executive Session.

A stenographic report of the proceedings was taken and forwarded to the Chairman. I believe this report has been circulated among the active members.

Matters came up which were not for public discussion, therefore, we have no further report to make.

The President: The Western Section Committee is composed of Messrs. Chenery, Davis and Rhoads. I understand Mr. Chenery has a report to make.

Mr. Chenery: We held four Meetings in Chicago, and discussed not only the same subject as Mr. Selden refers to, as having been discussed by the Eastern Section, but we also discussed other matters both of local and general interest.

At our first Meeting we decided that we would not have a stenographic report, but after having received the very complete report of the Meeting held in Mr. Selden's office, we decided to employ a stenographer for our future meetings.

The purpose of those meetings, as outlined in Atlantic City, was that each division would make reports and send them to each other. So far as we in the West are concerned, we failed in that respect. I hope we will improve on our methods next year.

The President: Is there any intention to make a report in Executive Session this year?

Mr. Selden: We considered that it was our duty to keep each other informed as to what was done, and if any matter of general interest came up to have it handled by the Association.

The only matter of very grave general interest that came up was of such a character that we treated it as a Legislative matter, and handled it only in Executive Session.

Mr. Ryder: I would move the acceptance of the reports of the Committees, and the continuance of the Committees.

(This motion was duly seconded by Mr. Dyer, and carried).

The President: This completes the report of the Standing Committees, with the exception of the Committee on Acknowledgments for Courtesies received. I will appoint Mr. Taylor and Mr. Millington a Committee to draft acknowledgments to the different concerns who have tendered us courtesies, and would ask these gentlemen to get to work right away, in order that they may report before we adjourn.

Mr. Davis: With the permission of the Meeting, I would like to read a letter which I have received from Mr. Frank F. Fowle, as Chairman of the Topics Committee.

Mr. Fowle says, "I regret to inform you that I do not now expect to be in attendance at Montreal, because of the necessity of my appearance in Court as a witness upon a case for which I have been engaged some time past.

"The paper which I promised to present is not in readiness, but with your permission I will complete it for publication in your annual proceedings.

"I deeply regret that I shall be unable to attend the annual convention, and I trust that you appreciate the circumstances which prevent my doing so.

"You have my best wishes for a successful programme, and I hope that my absence will in no way mar it.

"Please remember me kindly to all."

Yours very truly,

F. F. FOWLE.

Mr. Fowle, as you notice asks that we allow him to complete his paper and that he may send it in in time for publi-

cation in the minutes. I would move that we ask Mr. Fowle to complete his paper so that it may be incorporated in our minutes.

If you desire this I shall answer Mr. Fowle telling him that we shall be glad to have his paper.

This motion being duly seconded by Mr. Chenery, was carried.

The President: What other business have we before us at this time?

Mr. Davis: If it has not already been done I would like to move a sincere vote of thanks to the Arrangement Committee for the splendid manner in which they have taken care of us during our stay here, and for the provision they have made for our entertainment.

I do not think there is anyone here who does not thoroughly appreciate the courtesies which have been extended to us. Personally I think we have had a most successful meeting, from every point of view, and I think the Committee on Arrangements deserve a hearty vote of thanks from the Association.

Mr. Dailey: I thoroughly agree with what Mr. Davis has said. I think this has been a most successful and pleasant meeting. I for one have enjoyed it thoroughly, and I hope that our future meetings will be as well attended, and that future Committees on Arrangements will do as well by us as the Montreal Committee has done.

I have much pleasure in seconding Mr. Davis' motion of thanks to the Committee on Arrangements.

The Secretary: Gentlemen, you have heard the motion, and it is not necessary for me to say anything in connection with it. I know we all appreciate what has been done for us by the Committee on Arrangements, and the splendid man-

ner in which it has been done. I am sure our trip to Montreal is one that will be long remembered.

What is your pleasure with regard to Mr. Davis' motion that a cordial vote of thanks be extended to the Committee on Arrangements for the splendid manner in which they have looked after us during this meeting? Those in favor please stand.

The motion was carried amid applause.

The President: As Chairman of the Committee on Arrangements I wish to thank you very heartily. My part of the work has been very light indeed, owing to the co-operation of the other members of the Committee.

We only found it necessary to hold two Committee meetings. Mr. Magiff of St. Albans, came up to both meetings, and Mr. Forristall attended one of them. The other members of the Committee did not find it possible to attend.

As regards the arrangements made on the C. P. R., I must tell you that I did not have very much to do with them personally. Those arrangements were carried out by Mr. Kent, the manager of our telegraph system.

Mr. Ashald: As a member of the Committee on Arrangements I desire to express my thanks to the Association.

The President: For the information of the members in attendance we have arranged that the C. P. R. official time shall be given here today. This time is transmitted to every office on the C. P. R. system each day. When I say every office I mean every office on the railway system, and every commercial office of the Company. It is also transmitted to the Azores, to the West Indies, Fiji, etc.

Mr. Selden: Where does it come from?

The President: We get it from McGill Observatory.

A few years ago, under the auspices of the Government, signals were exchanged with Canso, Waterville and Greenwich, the different parties concerned changing places, so as to eliminate the personal error. Finally, as a check on the whole thing the circuit was connected through repeaters direct between McGill Observatory here and Greenwich Observatory in Great Britain. The time was compared, and after that the different observatories on the continent compared their time with McGill.

Mr. Taylor: I would move a vote of thanks to the Committee on Topics, for the able manner in which they have looked after the programme, or business end of the meeting, and for the splendid papers which they have provided.

In addition to this motion of thanks, I would suggest that we appoint the same committee for the coming year. I do not think we could do any better if we were to try from now till the date of our next meeting.

The President: With the consent of the meeting I will reappoint the Topics Committee, as suggested by Mr. Taylor.

The members of this Committee for the ensuing year will therefore be Messrs. J. L. Davis, E. Parsons and Percy Hewitt.

The next matter before us is the question of appointing a Committee on Arrangements. With the approval of the meeting I will appoint Messrs. Millington (Chairman), Marshall, Kinsman, Ashald and Kline.

So far as the Ladies' Reception Committee is concerned I think it would be as well for us to leave that in the hands of the Committee on Arrangements.

Is there any further business before the Chair?

Mr. Lathrop: There is something which I would like to

bring before the meeting, if it does not interfere with anything else.

It seems to me that there is a great variance in the methods used by the different Telegraph Companies, the Railway Companies, the American T. and T. Company, and some of the independent Companies, operating over railroad lines. I refer to the standards. It seems to me that it would be a good idea to have a Committee on Standardization on pole construction. I think it would help every Superintendent of Telegraph to have that class of work taken charge of.

I may say that the Signalling Association (of which I am a member) have such a committee, and I believe it would be a good idea for this Association to get in line and make itself heard.

The President: For the past two years we have had a Committee on Standardization.

Mr. Lathrop: I am informed that some of the Committees were discharged, and I was wondering if this was one of them. Personally I would like to see a Committee of some kind appointed on Standardization.

Since we have gone into the telephone business, and have various sizes of wire, and various constructions, it seems to me that we will have to meet conditions that we never looked for before, and that we will have to face difficulties that no single company has to face.

I do not think the telegraph or telephone companies would take exception to such an action, but on the other hand they would be glad to aid us.

I would like to see this Association get to the front and make itself heard.

The Secretary: I would like to ask Mr. Lathrop if he has any contract with any telegraph company?

Mr. Lathrop: We have a contract with the Eastern Union.

The Secretary: Then, you cannot do a single thing without the Western Union telling you to do it, and even then you will have to do it the way they say.

Mr. Lathrop: If we had a committee to work on that it might improve the matter.

Mr. Selden: I understand that Mr. Fowle has intimated in a letter read here to day that he will have his paper ready for publication in our minutes. Will this paper not show what has been done by the Committee?

The President: I am afraid it will not.

The Committee referred to was composed of Mr. Wm. Maver, who is a consulting engineer, and an expert on such matters, Mr. C. H. Bristol, General Superintendent of Construction of the Western Union Telegraph Company, and Mr. F. F. Fowle, who at that time was in the railway department of the A. T. and T. Company.

Mr. Lathrop: I did not understand that the Committee was disposed of. I beg your pardon.

Mr. Davis: I am afraid that there is a misunderstanding in regard to the matter, or at least in regard to a part of it.

Mr. Fowle was asked to read a paper before this Association, on the subject of the telephone. This paper is not ready yet, but it will appear in the minutes.

So far as the work of the Committee is concerned the paper will not deal with it at all.

The Committee has been discharged, and the only thing to do now is to let the matter drop, or appoint another Committee. If it is the intention of the meeting to appoint another Committee on the same subject I would suggest that we appoint the same men again. I do not see how we can possibly beat them in that line of work.

Mr. Boyce: I would like to ask whether this year there is any Committee in charge of the matter of high tension crossings over railway company's property?

I think it would be well to have this matter looked after in some way—either appoint a special Committee to take care of it, or to put it into the hands of some other Committee as part of their duties.

We have a great many bare lines crossing our road, and I think it would be a good idea to have the matter enquired into.

The President: We have had a Committee on that subject for the past two years, and they brought in their report and were discharged. The whole thing was fully threshed out last year. This was not only the case last year, but a few years after I joined the Association the same thing was gone into and fully dealt with.

Mr. Boyce: There is no uniformity of method, as I understand it. I know that a great many of the Companies are revising their specifications, and I think this would be a good time to take the matter up.

Mr. Lathrop: I was going to propose that the gentleman who made the motion that the Committee should be discharged, might withdraw his motion, and we could then continue the Committee for another year.

The Secretary: But, we do not want the Committee.

The position we are in is this—there are certain rules which they give us, and that is the end of the matter.

Mr. Lathrop: Does that apply to overhead crossings?

Mr. Dailey: There is one thing that Mr. Bristol has nothing to do with, and that is the overhead crossing. The railroad company has to do with that entirely. I am now referring to the high tension wire crossings over the road.

Every week or so we have requests from electric light companies, and others, for permission to cross our tracks with electric light wires, or other high tension wires. This is a matter that we have to deal with ourselves. We are not subject to any outside interference in this case, from the Western Union or anybody else.

It seems to me that this is important enough to have a Committee appointed to deal with, and see if we cannot get together and have standard rules for those crossings.

We have two or three different kinds of crossings on our road, and I say frankly I do not know which one is the best. It seems to me that if the matter were specially taken up by a Committee of this Association, and this Committee made a report, we would be glad to take their conclusions as to which of those plans of crossing was the best.

I believe we ought to have somebody appointed to determine that, or to at least look into the subject and bring it up for discussion and bring it up at some of the Eastern or Western Quarterly Committee Meetings. I believe we ought to have a standardization of that kind of crossing.

The President: In order to bring the matter regularly before the Meeting we will have to have a motion.

Mr. Davis: Under those circumstances I would move that a Committee be appointed to draft up specifications for high tension and other crossings for Railroad Companies, where the poles are on the right of way of the Company.

Mr. Williams: I will second Mr. Davis' motion.

The Secretary: We have had that question up for years. It has been in our Minutes right along. You will find it dealt with at pages 218 to 229 of last year's Meeting. The topic was then very thoroughly covered.

Now, what is the use of going over this ground again?

If you will look at the Minutes you will find that this matter has been thoroughly dealt with.

Under the circumstances I move that the resolution be tabled.

This motion was duly seconded by Mr. Walstrum and on being put to the Meeting was declared lost.

Mr. Cellar: It is very true that we have had a Committee on wire crossings, for a number of years, and that we have had full and voluminous reports on the subject, but we must bear in mind the fact that this question of crossings, and especially the question of high tension crossings, is a very live one today. It is also true that a very great number of the wire crossing constructions over some roads is very defective, and I think that anything we can do as an Association, in the matter of united effort to secure even a small percentage of improvement is time and money well spent.

Mr. Dailey: I think Mr. Cellar is perfectly correct.

This Association did outline certain plans but they have not been carried to fulfillment. I do not think there is any use starting something unless you finish it. The immediate effect of our first effort was that in certain States we were instrumental in having laws passed governing the construction of crossings over railroad tracks. In the State of Iowa we have had a law passed which has been of great benefit to our road and to other roads, because now we can have a crossing which has to be approved of. Before that there was not any such law, and they could put in almost anything they liked.

I think the proper thing for us to do is to keep up this agitation on the whole question, and to work at it with a determination to have the matter improved. Whether this be done by one Committee, or by two Committees is imma-

terial. The point is to keep the question before us, and to keep it before the various Legislatures.

What we want is good, safe construction, and we never would have anything of the kind, if we did not keep at it. So, if the old Committee is discharged, we ought to appoint another Committee, or we ought to do something to keep the question up, and to give us a general programme looking in the direction of standard construction.

Mr. Dyer: I think much good can be accomplished by such a Committee. While I admit that the construction rules made by Mr. Bristol, ought to be followed, in regard to the Western Union Pole Lines, I do not see any objection to coming to an understanding in regard to telephone lines, or electric light lines.

The Secretary: The question is now in regard to crossings over the railroads.

Mr. Dyer: I am leaving that aside for the moment. It seems to me that the Committee could handle the matter of overhead crossings. In Utah, Nevada, and a part of California, a number of large power plants are being erected to deliver power to the mines. We have been up against it time and again there in regard to the crossings. There seems to be a rule out there which has been followed for a number of years, that twenty-two feet above the Railway is sufficient. Upon the Southern Pacific, after the matter had been taken up by the Railroad Commission, in connection with the Santa Fe and others roads, the engineers appointed to handle the matter decided that the crossing should be thirty-three feet above the Railroad. This compelled the Companies to use thirty-five or forty foot poles, and in some instances, even forty-five foot poles, according to the lay of the ground. Before that they practically paid no attention to the Railroad Companies in their requests for making such

crossings. It seems to me that a Committee appointed by this Association might consider, or formulate a rule that would be considered fair and right and safe for all concerned, and would enable us to obtain Legislation in the various States to compel those power companies that cross our tracks to make their crossings in a safe and proper manner.

I think this is a very important matter, and I would like to see a Committee appointed to look into it.

Mr. Chenery: If the purpose of this Committee is to secure information to present to the various Legislatures when they meet next, and to attempt to secure some law in the States where there is none at the present time, I would say that the appointment of such a Committee would be all right.

The Secretary: So would I.

Mr. Chenery: As a matter of fact we have talked of this matter pretty thoroughly at preceding meetings. Before the last Legislatures met in the various States this Association, through its members, attempted to secure some Legislation in regard to those crossings and we were successful.

A great many of the members here present will remember that the laws of Michigan were taken as a pretty good type. Ohio was another State which was pretty considerate. Canada is also pretty well forward. It was also pointed out that very recently similar laws, or laws that answered our purposes fairly well were passed in Kansas.

I know so far as the territory to which we run is concerned, that we were unsuccessful in getting laws passed in Missouri and Arkansas. I believe, however, that laws were passed in Colorado and Wyoming. Mr. Dailey informs me that similar laws were passed in Iowa and possibly in some other States.

However, through the members of this Association, we have been able to do a great deal. But, it does not seem quite clear to me how a Committee can formulate and standardize construction methods and expect them to be lived up to in all the States, because all the States are not alike.

If, however, a Committee is to formulate such information as they can respecting the various States, and attempt to secure similar laws in States where there are no such laws. I would be glad to see such a Committee appointed.

Mr. Rhoads: Many of you, no doubt, noticed that within the past sixty days, there was a meeting of the Railway Commissions of several States of the middle west. This meeting was held in Chicago, and I was glad to observe that one of the items which they had up for discussion was the need of better protection to Railway property and Railway employees, by making it a misdemeanor for people to walk on the right of way.

A suggestion was made by them that they talk it over with the different Legislatures.

One of the greatest things I fear in my territory in regard to many of those crossings is owing to the broken insulators on the poles, which makes it dangerous, owing to their liability to fall on our wires, or for our wires to fall on them. During the last year, I may say, that we had forty-two thousand insulators renewed on our road. The Railroad Commission proposed, as far as possible, to make it a misdemeanor for people to walk on the right of way.

Well, we were not able to get the law through in Indiana. It was presented to the attorneys who were handling the Legislative affairs, but owing to the agitation against the Railways, it was decided that it was best not to take the matter up.

Now, however, this move coming from the Railroad Commission will aid the Railroads a great deal.

Mr. Van Etten: Might I ask whether Mr. Groce is Chairman of that Committee.

Secretary Drew: Yes, Mr. Groce is Chairman of the Committee. His report is here in the Minutes, covering eight pages. He mentions the different States, and what they have done, you will find that nearly all the States have brought the matter up, that it is almost exclusively in the hands of the Commissions. They are the ones who are going to see about high tension crossings, and designate what they shall be.

Mr. Selden: There are a great many States which have no Railroad Commissions at all. I believe Maryland has none.

The Secretary: You will remember that we got up a very elaborate circular, in reference to a law that we wished to be passed. We headed this "Protection of Train Men."

The main object of trying to cover the high tension wires crossing the tracks was to protect the train men. We thought that by heading it that way it would have a greater effect on the Legislatures, before which it would be presented.

We sent out hundreds of copies of that circular. Some of the roads asked for as many as forty or fifty of them, so that they could present them to all those who were favorable to it in the Legislatures.

These copies were printed and distributed at our expense and did the work, to a great degree, upon which the Committee reported.

I think it is all right to have a Committee to keep up an agitation if you want to attain something, but I do not see what the object of a Committee is after you have gained all you can expect to attain.

Mr. Dyer: It appears that in some States satisfactory Legislation has been obtained. Now, since one Committee has done so much good work, don't you think another Committee might accomplish the same result in other States?

Discussing the matter with the Commissioner in Nevada, he wanted to know what had been done in other States. I told him, as far as I could. I think that with the endorsement of an Association of this kind, recommending certain crossings, we would have considerable influence behind us, in our efforts to obtain what we want in the States which are not now taken care of.

Mr. Cellar: We must all bear in mind that this question of wire crossing construction is not a dead and buried thing. I don't care what we have the Committee for. What we want is to keep up the agitation, and I think we have had enough success in the past, and from the testimony given by the gentlemen who have addressed us, to warrant us in continuing a Committee on wires.

We have cases coming up every day when permission is asked from us to construct wires carrying one hundred thousand volts across our right of way. This is something that ought to be given careful thought. We are all liable to have that kind of thing occur at any time.

I think the very best thing we can do is to secure the hearty co-operation of every member of this Association in keeping up the agitation for the proper construction of those crossings. If we do this I have no doubt that the Railway Commissions will help us out.

While the laws in some States do not empower the Railway Commission to take special notice of the wire crossings, I find that some of the Commissions themselves are taking the matter up and giving us all the help they can, and it will only be through the team work of the whole Association

that we will receive the fullest effect of any effort made in the direction I refer to.

Mr. Chenery: In order that I may be understood as being in hearty co-operation with the members on the subject, I would move in amendment that the purpose of the Committee be to enlist the efforts of all the members and legal departments generally to secure Legislative action on this subject at the next meeting of the various Legislatures, in States where no such laws now exist.

Mr. Davis: Before you can do anything in that line I believe there has to be a Committee on Standardization. Before we can go to the Legal Department and talk to them, we have to have certain information in regard to what we want done. We have to be in a position to say what we want.

On the Chicago and Eastern Illinois any body who wants to string a wire across the railroad is referred to the Engineer of Maintenance of Way.

Mr. Drew: On a public highway?

Mr. Davis: Yes.

Mr. Drew: It seems to me that they have the right to do what they like on a public highway.

Mr. Davis: In many cases they come to us and say they would like to have an understanding with us, in order that we might agree.

Secretary Drew: That is all very well on private property, but not on a public highway. On a highway they have as much right as you have.

Mr. Davis: Well, at the same time, we have had a little trouble, and I don't know the proper thing to do.

I wrote to Mr. Cellar and asked him if he would not let me have a copy of their Standard form of agreement, but

not in one case have I been able to have that agreement accepted by the fellow who wants to string wires across our right of way. They simply come and say the construction we put in is good and they go ahead and string up their wires, and after the wire is there you have to fight them. We are practically helpless as things stand at present. Those people have said in a great many cases, "It is ridiculous to ask us to put up a construction of that kind. Nobody wants to spend eight hundred or twelve hundred dollars for a crossing."

As a result of that, I got together with the Signal Engineer of the Railroad, and we called in the Chief Lineman and Signal Supervisors. We held two or three meetings, and tried to work the thing out. We sent out Chief Lineman to get information and we got some splendid information from Mr. Millington on what we were trying to do.

In one case we are trying to get a fellow to sign a standard agreement or put it up to the State Commission. He said, "Don't do that, because if we once get it into the hands of the Commission nobody knows what it will mean to me."

Before we get any Legislation we ought to get together, and determine what we want, and what we expect to get.

If Mr. Chenery's amendment incorporates that, I am most heartily in accord with it. I think it would be the duty of the Committee to figure out what kind of crossing we ought to have, and also to study out what constitutes a high tension current and what constitutes a low tension current.

As the matter stands now, I believe an electric light circuit is considered as a high tension current, although it is only one hundred and ten volts.

I think if the Committee is appointed it should work out what we want, and submit it to the Association for approval, before we try to have it made legal.

The President: It is moved in amendment, by Mr. Chenery, seconded by Mr. Selden, that the purpose of the Committee be to secure such data as may be necessary to bring about Legislation covering wire crossings in States where no such laws now exist.

Mr. Cellar: I would suggest that the words "To bring about Legislation" be omitted from the motion.

Mr. Dyer: If Mr. Cellar will put that as a motion, I will be glad to second it.

Mr. Cellar: I will do so.

The Secretary: If you do not secure Legislation you cannot do anything. Of course, it is a different thing where a party comes along on a farm, and wants to run a wire across your tracks. That is a question of your own private property.

If, however, a telephone company, gets a Charter, or if an electric light company or a street railway company gets a Charter to occupy and make use of a highway, you cannot do anything with them. You cannot stop them, and you cannot make them put up anything except what they are compelled to do by the State.

Of course, if a man comes to you, and wants to cross your road, where it is private property, you can impose any obligations you please, because the property is yours, up to the sky. When it comes to a question of a public highway crossing, properly opened by a County Commissioner, and a company gets a right to string wires along that public highway, they can go across your road and you cannot stop them.

So, if you drop out the question of procuring Legislation you are helpless. You can go to a man and say, "I want you to put up an eight hundred dollar crossing, where you are going over my tracks." He will simply smile and answer, "Go to!"

Mr. Dyer: In explanation of my seconding of that motion and in reply to Mr. Davis, that we must first get up some kind of a rule or regulation before we ask for Legislation, which rule or regulation we can use as a basis for what we want, I may say that I have in mind the instance of one little power company in Nevada which is willing and anxious to do anything that is fit and proper.

The Secretary: Do they want to cross your lines on a public street?

Mr. Dyer: No.

The Secretary: Then that is an entirely different thing.

Mr. Dyer: If we show those companies that we are backed up by an organization such as this, which has considered and approved of the rules and regulations for such crossings I do not think we would have any difficulty in making them do the work that we want them to do.

I agree with what has been said in regard to having something to present to the Commissions or Legislatures, when we go before them. I think there is no use of going before them without knowing exactly what we want.

Mr. Cellar: The amendment I seek to make is one which will broaden the Committee's work, and not confine it to efforts for Legislation.

The Committee would have a lot of work to do before it reaches the Legislative point, and that is the reason why I offer my amendment as far as the securing of Legislation is concerned.

As far as securing crossings according to our Standards is concerned, I must say that we have had some success, notwithstanding the fact that some of the crossings were on the highway. I quite appreciate the fact that any regularly organized company with ordinary powers can cross the right of way of a railroad on a public highway, if it wants to.

I think this is a subject that requires untiring effort and co-operation, and that everybody who has the interests of this organization at heart, and the interests of the Railroad generally should give the matter his careful consideration.

It is for those reasons that I would like to see the amendment obtained.

Mr. MacFarlane: This question has been up for years and years. I do not know but what I was one of the most insistent members of the organization in bringing it to the front. We have bumped up against it pretty hard.

We all know pretty well what construction is necessary for those crossings, but, at the same time, we have to recognize the rights of the other fellow.

You cannot do anything except through Legislation, or by convincing the man who wants to cross your right of way, that he has to build his crossing right.

I think an expression from this meeting to the effect that we ought to continue the agitation and that the members of this Association through their General Managers and their Legal Departments ought to continue to seek Legislation that will compel good and safe crossings, both for high tension wires, and other wire crossings.

Of course, you can make this expression as strong as you like. In fact, I think the stronger it is the better it will be. I think this would have a great deal of effect, when the matter comes up for adjustment before the Commission of any State.

We know what we want. There is not a Superintendent of Telegraph here, who is in charge of construction, but who knows exactly what he wants in that line. If he had an expression of opinion from this Association, he could put the matter up to his Legal Department, or the General Manager.

I am certainly of the opinion that it is Legislation that we want.

Mr. Selden: The Legislature can certainly arrange for a high tension wire crossing, basing itself upon such information as it has.

Mr. Dailey: Leaving aside the question of Legislation altogether. Is it not important enough to have that matter determined, and for this Association to arrive at a Standard to follow, even if we do not obtain Legislation. I am not inclined to agree with our Secretary that we can hold them up in all cases crossing private tracks. It seems to me that would depend upon where you are, and certain other conditions.

Even though we do not obtain Legislation I think we ought to determine upon some standard for those crossings.

I have no desire at all to mix up this convention in any technical parliamentary discussion, but I believe that a substitute for the whole thing would simplify matters. I, therefore, offer as a substitute, the following motion:

That a Committee be appointed to determine upon a standard crossing, for high voltage wires and other wires, and to obtain such Legislation as they are able to obtain in the various States which have no Legislation on the subject at the present time.

Mr. Chenery: I think that is a very good idea of Mr. Dailey. It simplifies the matter a great deal, and I have much pleasure in seconding his motion.

Mr. Van Etten: Is not that the same as the original motion?

Mr. Dailey: Not exactly.

Mr. Van Etten: I would suggest that the Committee be instructed to confer with the electric light companies, the power companies, and the street railway companies who have an organization.

Mr. Dailey: Of course, the Committee would have power to do that.

Mr. Dailey's motion being put to the Meeting is declared carried.

The President: We have now almost completed our programme. About the only thing that remains for us to do is to receive the report of the Committee on resolutions of acknowledgment. Mr. Taylor is Chairman of the Committee.

Mr. Taylor: The Committee appointed to draft resolutions of acknowledgment to the different interests which have contributed so largely to the success of this Meeting of our Association begs to report that the hearty thanks of this Association are due to the different concerns and interests which have contributed so largely to the success of this Meeting of our Association, a Meeting which has been one of special merit, and one of the most valuable and largely attended in its history.

We wish to express our thorough appreciation of the entertainment which has been afforded to the members of the Association, and the ladies accompanying them.

The hearty thanks of this Association are due to the following interests:

Canadian Pacific Railway Company.

Grand Trunk Railway Company.

Pullman Palace Car Company.

Richelieu and Ontario Navigation Company.

Quebec Railway, Light and Power Company.

Montreal Street Railway Company.

Great North Western and Western Union Telegraph Companies.

Canadian Pacific and Postal Telegraph Companies.

American Telephone and Telegraph Company.

Bell Telephone Company of Canada.

Mr. Charles R. Hosmer.

On behalf of the Committee on Acknowledgments, I move that this report be received and adopted.

This motion being duly seconded by Mr. Cellar, was carried unanimously.

The Secretary: I would like to call your attention to the fact that the Committee to be appointed in reference to the Wire Crossings has not been named.

Mr. Davis: If I am not entirely out of order I would like to move that Mr. Cellar be appointed Chairman of the Committee.

This motion was duly seconded by Mr. Williams and carried.

The President: Are there any other suggestions as to who shall form the Committee?

Mr. Chenery: I would suggest that Mr. Groce of the Illinois Central be appointed a member of the Committee.

Mr. Rhoads: And I would suggest that Mr. C. H. Bristol be also appointed a member of the Committee.

Mr. Williams: I would suggest that Mr. Millington be appointed a member of the Committee.

The President: Mr. Dailey is Vice-President of this Association, and if he has not any more work to do in connection with that office than I had, I think he could very well afford the time to serve upon the Committee.

If there is no objection I will therefore appoint the following gentlemen as members of the Committee: Messers. G. A. Cellar, Chairman, G. H. Groce, G. W. Dailey, C. H. Bristol, E. H. Millington.

Mr. Chenery: It has been suggested that most of these members are from the West. I would, therefore, like to suggest that Mr. Selden's name be added to that Committee.

Mr. Williams: Inasmuch as this is a Railroad proposition I would move that Mr. Selden's name be substituted for Mr. Bristol's.

The President: Is it your desire that I should replace Mr. Bristol by Mr. Selden on that Committee?

Mr. Van Etten: I think we may take it for granted that even though Mr. Bristol were not on the Committee that he would be only too happy to give the members of the Committee any information in his power.

Mr. Selden's name was then substituted for Mr. Bristol's as a member of the Committee.

The President: I think that completes the business before the Association.

Before we adjourn I wish to extend my thanks to the members of the Association, Active, Associate and Honorary for the help they have given me in making this session a success, which I think it has been.

There is another matter which I would like to mention as a final word in connection with our Twenty-seventh Annual Convention, and that is a word of appreciation in regard to the delicate compliment which has been paid us

in the matter of our badges. Our worthy Secretary recognized the fact that we were British subjects on this side of the line, and had a badge prepared showing the face of the best Sovereign in the world, and his Royal Consort.

On behalf of the Canadian members of the Association, I wish to say that we appreciate this delicate compliment very much.

Mr. Williams: Seeing that there is no further business before us, I would move that the Convention be now declared closed, to meet again in the City of Detroit, at the call of the President.

This motion being duly seconded, was carried.

And the Convention thereafter adjourned.

(Mr. Fowle's paper was not prepared in time for insertion in the Minutes. The topic is "High Tension Wire Crossings." It is expected it will be printed in pamphlet form and copiously illustrated).

EXHIBITS AND EXHIBITORS.

The Western Electric Company had on exhibition a complete line of telephone equipment for use in railway service. This included special transmitter arms to be used in connection with train dispatching, besides other telephone equipment for use in conjunction with such service. Then there was a full line of composite telephones, such as wall sets, portable sets and line poles; also weather-proof wire pole telephone sets, besides portable car sets for regular telephone lines. In addition to this a complete collection of telegraph equipment was displayed. The Gill and Burlington selectors, both of which are sold by this company, and which were included in the display, were shown in operation. A very attractive feature of this exhibit was a large artistic sign beautifully decorated with small flags of all nations, showing the countries where Western Electric apparatus is used. The Western Electric Company was represented by W. E. Harkness, sales engineer, and M. E. Launbranch, engineer, of New York; C. L. Howk and H. C. Currier, engineers, of Chicago.

The United States Electric Company, of New York, gave its exhibition in connection with that of the Western Electric Company, showing the most recent adaptations of the Gill selector to the telephone in train despatching. It consisted of an entire telephone selective apparatus for a dispatcher's office and the associated station equipments. This outfit, which is the one now in actual use on the New York Central, Canadian Pacific, Lake Shore and Michigan Southern, and several other railroads, is so arranged that the dispatcher can call automatically any station at will on the circuit and get an automatic answer back in seven seconds. A further exhibit was made of the Gill selector showing its adaptation to high speed multiple calling. This comprised twenty-four station equipments with a train

dispatcher's automatic calling device, consisting of a case containing twenty-four push buttons and an automatic signal call box to operate the same. The dispatcher, when calling, first presses the buttons corresponding to the station or stations he wishes to call, the automatic signal is then set in motion and any or all stations desired are called by one operation. By this method any one of the stations can be called in from one to six seconds, and all of the 24 stations can be called in 18 seconds. This method recommends itself particularly wherever it is desirable to call several stations together to issue train orders. This company was represented at the convention by Edwin R. Gill, the inventor of the Gill selectors; Harrison Osborne, secretary, and Howard E. Merrell, the general manager.

The exhibit of the Stromberg-Carlson Telephone Manufacturing Company, of Rochester, N. Y., presented a well-arranged operating display of their selective alarm telephone dispatching system. The apparatus for a complete dispatcher's office located on one side of the room was connected up as in regular practice with five complete equipments representing local stations as placed on a division of a railroad of any length. A feature that was not instantly appreciated by visitors unfamiliar with this equipment was that this system operated its selectors on a common battery circuit, requiring a pressure of only .15 of an ampere. The telephone instruments shown with this particular selective equipment were of the local battery type as recommended for this service. This system embraces a telephone line and has superimposed on this line selective devices in a manner similar to the application of telegraph signals of the simplex type, provisions being made for applying the signaling mechanism and operating the same without interference with the telephone conversations.

The Stromberg-Carlson Company was represented at the

convention by H. C. Slemin, S. R. Wright, Charles E. Hague and E. C. Lewis.

The Sandwich Electric Company, of Sandwich, Ill., was represented by H. O. Rugh and J. A. Rugh. Their demonstration consisted of the well-known Sandwich telegraphone, with telephone train dispatching equipment, operating in conjunction with the No. 2 Sandwich selector. The important feature of maintaining a means of communication during circuit failure was efficiently demonstrated and met with general approval.

Mr. J. J. Ghegan, president of J. H. Bunnell & Co., Inc., of New York, manufacturers of telegraph apparatus and appliances, dry batteries, etc., distributed a beautiful souvenir book of views of Montreal, which was very acceptable to the visitors and one which will be preserved as a memento of their trip to the Canadian metropolis. Mr. Ghegan expressed himself as delighted with his visit, which enabled him to renew many pleasant friendships as well as to acquire a number of new ones.

The Railroad Supply Company, of Chicago, was represented by Mr. E. W. Vogel, signal engineer. The company had a very interesting exhibit of the Chicago crossing signal. The exhibit shown by Mr. Vogel was a miniature signal, complete in all its details and equipped with a Chicago automatic cut-out, which makes it entirely practical to install track-circuit crossing alarms at crossings adjacent to stations. By the use of this device the alarm will not ring unnecessarily and thus make a nuisance of itself when locals are standing on the track-circuit doing switching or other work. The company also exhibited its line of lightning arresters, styles A, B and C, which are of the choke-coil pattern and which are designed to be put in series with the instruments to be protected. These arresters are furnished with or without fuse. The company also had on

exhibition a new style of lightning arrester, which is termed the style F arrester. This arrester is entirely new in principle and embodies several advantageous features. The arrester is so designed that all parts are in plain view and can be instantly taken apart for inspection without opening or grounding any lines. The arresters are mounted upon slate or porcelain bases, and as they are equipped for use with or without fuse, it is entirely practical to use same in series or in multiple.

Mr. Richard D. Brixey, son of, and general manager for W. R. Brixey, New York, manufacturer of the well known Kerite wires, was present at the convention, accompanied by Percy W. Miller of his office. Mr. J. V. Watson, president of the Watson Insulated Wire Company, of Chicago, the Western representative of the Brixey concern, was also present.

Mr. John Langan, of the Okonite Company, New York, manufacturer of the well known wires, tape, etc., bearing that name, was in attendance at the convention, as is his habit.

The L. M. Ericsson Telephone Manufacturing Company, Buffalo, N. Y., represented by L. M. and T. S. Hemenway, made an excellent display in their exhibit, which embraced a full line of the products of their manufacture.

Another exhibit was that of the Homer Roberts Telephone Company, of Chicago, in which the special features known as the "Roberts System," a development of that company, received attention.

ASSOCIATION
OF
Railway Telegraph Superintendents

PROCEEDINGS
OF THE
Annual Meeting Held at Detroit

JUNE 23rd, 24th and 25th, 1909.

CONSTITUTION, BY-LAWS, LIST OF MEMBERS, ETC.

Press of
J. H. Yewdale & Sons Co., Milwaukee, Wis.
1909

ANNOUNCEMENT

The Association was formed in Chicago, November 20, 1882.
Its object is the improvement of the railway telegraph service.

The next annual meeting will be held at Los Angeles, Cal., May
16th to 20th, 1910.

The undersigned will be glad to answer any inquiries in reference
to the Association.

JOHN L. DAVIS, President,
Chicago, Ill.

I. T. DYER, 1st Vice-President,
Los Angeles, Cal.

G. A. CELLAR, 2nd Vice-President,
Pittsburgh, Pa.

P. W. DREW, Sec'y and Treas.
Chicago, Ill.

329
187

128

E. C. W.

THE ASSOCIATION
OF
Railway Telegraph Superintendents

Organized in Chicago, Nov. 20th, 1882.

CONSTITUTION AND BY-LAWS

OFFICERS

PRESIDENT.

John L. Davis.....Chicago, Ill.
Chicago and Eastern Illinois R. R.

FIRST VICE-PRESIDENT.

I. T. Dyer.....Los Angeles, Cal.
San Pedro, Los Angeles and Salt Lake Ry.

SECOND VICE-PRESIDENT.

G. A. Cellar.....Pittsburgh, Pa.
Penn. Lines West of Pittsburgh.

SECRETARY AND TREASURER.

P. W. Drew.....Chicago, Ill.
Minneapolis, St. Paul and Sault Ste. Marie Ry.

EXECUTIVE COMMITTEE.

John L. Davis, Chairman,

I. T. Dyer,

G. A. Cellar,

P. W. Drew,

C. Selden,

E. A. Chenery.

EASTERN DIVISION.

Chairman.....C. Selden.....Baltimore, Md.
B. & O. R. R.

WESTERN DIVISION.

Chairman.....E. A. Chenery.....St. Louis, Mo.
Missouri Pacific Ry.

ENTERTAINMENT COMMITTEE.

Mr. I. T. Dyer,
 Mr. F. S. Rawlins,
 Mr. E. A. Klippel,
 Mr. B. F. Frobes,
 Mr. B. A. Kaiser,
 Mr. P. W. Miller,
 Mr. A. P. Eckert.

AUDITING COMMITTEE.

Mr. A. B. Taylor, Mr. F. G. Sherman.

TOPICS COMMITTEE.

Mr. J. B. Sheldon,
 Mr. F. E. Bentley,
 Mr. J. G. Jennings.

SPECIAL COMMITTEES

COMMITTEE ON HIGH TENSION WIRE CROSSINGS.

G. A. Cellar,

G. H. Groce,

W. W. Ashald,

A. B. Cline,

C. Selden.

LADIES' RECEPTION COMMITTEE.

Mrs. B. F. Frobes,

Mrs. I. T. Dyer,

Mrs. F. S. Rawlins,

Mrs. E. F. Raymond,

Mrs. H. C. Chace.

Mrs. J. B. Sheldon.

COMMITTEE ON RESOLUTIONS.

Mr. W. W. Ryder.

Mr. E. P. Griffith,

Mr. E. J. Little.

ASSOCIATION OF RAILWAY TELE- GRAPH SUPERINTENDENTS

CONSTITUTION, BY-LAWS AND STANDING RULES

CONSTITUTION

ARTICLE I.

Name.

Name This organization shall be known as the Association of Railway Telegraph Superintendents.

ARTICLE II.

Object.

Object The object of this Association shall be the advancement of the efficiency of the telegraph, telephone and other electrical departments of the railroad service.

ARTICLE III.

Membership.

Sec. 1. Membership in this Association shall be of three classes, active, associate and honorary.

Active Sec. 2. Active members shall be those who are connected in an official capacity with the telegraph, telephone or their electrical departments of any railway.

Associate Sec. 3. Associate members shall be those who are engaged in professions or business directly or indirectly connected with the operation of railways.

Honorary Honorary membership may be conferred upon those who have attained eminence in the telegraph, telephone or other electrical service, or who have in any manner contributed to the success of this Association.

- Applications** Sec. 5. All applications for membership shall be made in writing to the Secretary and presented by him to the Executive Committee. If approved by the Executive Committee, the applications shall be presented to the Association for action at the annual meeting.
- Vote** Election of active and associate members shall be by ballot, and seven negative votes shall exclude from membership. It shall require a unanimous vote by ballot to elect honorary members.
- Rejection** In case of rejection of any candidate his application and its consideration shall not be mentioned in the published proceedings.
- Form** Application for admission to active or associate membership shall state the candidate's name, occupation and address. Proposal for honorary membership shall be signed by an active member, shall give the present position of the party proposed and an outline of his professional or business career.
- Rights** Sec. 6. The right to hold office, vote and attend executive sessions shall be vested in active members only. Associate and honorary members shall be entitled to all other privileges of the Association.
- Resignations** Sec. 7. Any member may resign his membership by formal withdrawal after payment of all dues and assessments to date.

ARTICLE IV.

Divisions.

- Formation** Sec. 1. This Association shall be divided into two divisions. Those members whose headquarters are east of the eastern limit of Central Time shall form the Eastern Division, and those west of said limit shall form the Western Division.
- Officers of** Sec. 2. Each division shall elect its chairman at first meeting of such division following the annual meeting of the Association.
- Rules Governing** Sec. 3. Each division may make its own regulations in so far as they do not conflict with the rules governing the Association.

ARTICLE V.

Officers.

- Officers** Sec. 1. The officers of this Association shall be a President, a First and a Second Vice-President, a Secretary and a Treasurer. The last two offices may be filled by one person.

- Ex Com.** Sec. 2. The officers of the Association, together with the Chairman of each division, shall constitute an Executive Committee.
- Election** Sec. 3. Nomination and election of all officers shall be by ballot and plurality vote shall elect.
- Term** Sec. 4. The term of each officer shall begin at the installation of officers at the annual meeting at which he is elected, and continue one year or until his successor is duly elected.
- Vacancy** Sec. 5. If a vacancy occurs in any office it may be filled for the balance of the year by appointment by the President approved by the Executive Committee.

ARTICLE VI.

Meetings.

- Annual** Sec. 1. The majority vote of the members present at the annual meeting shall designate the time and place of the next annual meeting.
- Special** Sec. 2. Special meetings of the Association may be called by the President or any two members of the Executive Committee. No business shall be transacted as special meetings except that stated in the call.
- Ex. Com.** Sec. 3. Meetings of the Executive Committee shall be upon call of the President or any two members thereof.
- Divisional** Sec. 4. Two meetings of each division shall be held each year. The meetings of the Eastern Division to be held in the months of November and March, and of the Western Division, in September and January, at a time and place to be designated by the chairman of the division, of which due notice shall be given to the members thereof by him; additional meetings may be held upon the written request of two members of the division.

ARTICLE VII.

Quorum.

- Quorum** Fifteen members shall constitute a quorum at all meetings of the Association and five members at all meetings of its divisions.

ARTICLE VIII.

Amendments.

- Amendments** This Constitution may be amended at any annual meeting by a two-thirds vote of the members present, the proposed amendments having been submitted in writing to the Executive Committee and a copy having been sent to each member by the Committee thirty days prior to the meeting at which they are to be considered.

ARTICLE IX.

Robert's Rules of Order shall govern the deliberations at all meetings when not in conflict with the Constitution and By-Laws herein set forth.

BY-LAWS

ARTICLE I.

Dues.

Dues

Sec. 1. The annual dues for both active and associate members shall be seven dollars and fifty cents (\$7.50), payable in advance, on or before July 1st.

Assessments

Sec. 2. When necessary to meet expenses in excess of receipts a pro rata assessment may be levied upon active and associate members.

Sec. 3. Honorary members shall be exempt from all dues and assessments.

Arrears

Sec. 4. Any member who is in arrears in payment of dues or assessments ninety days after the annual meeting shall be considered suspended, and his name shall be dropped from the roll of membership.

Reinstate

Sec. 5. A member who has been suspended for non-payment of dues or assessments may apply to the Executive Committee for reinstatement, such application to be accompanied by all dues and assessments in arrears. A majority vote of the Executive Committee will reinstate.

ARTICLE II.

Duties of Officers.

President

Sec. 1. It shall be the duty of the President to preside at all meetings of the Association and of the Executive Committee; to have general supervision of all business and to sign all orders upon the Treasurer.

Vice-President

Sec. 2. It shall be the duty of the First and the Second Vice-President in their order to perform all the duties of the President in his absence or inability to act.

Division Chairman

Sec. 3. It shall be the duty of the Chairman of each division to preside at all meetings of his division and to have general supervision of the business of such division.

Secretary

Sec. 4. It shall be the duty of the Secretary to keep the records of all meetings of the Association and Executive Committee, and to compile information for the use of the Association and of the various committees thereof which he may from time to time be directed to obtain; to keep an accurate classified list of the membership of the Association with the address of each member; receive and present all applications for membership; issue all notices; draw all orders on the Treasurer; prepare, have published and mail to each member within a reasonable time after the annual meeting, two copies (standard size, 6x9), of the proceedings of such annual meeting; attend to the correspondence of the Association, and perform such other duties pertaining to his office as the Executive Committee may direct.

Treasurer

Sec. 5. The Treasurer shall have charge of all funds of the Association; shall pay upon presentation of orders signed by the President, such bills as have been approved by the Executive Committee; receive all moneys due the Association; keep an accurate account of all receipts and disbursements; make report to the Executive Committee when called for by that body, and to the Association at the annual meeting.

Ex. Com.

Sec. 6. The Executive Committee shall have general management of the affairs of the Association. No unusual or extraordinary expenses shall be incurred without its approval.

ARTICLE III.**Committees.****Standing**

Sec. 1. The Standing Committees shall be as follows: Auditing, Entertainment and Topic. The President shall be ex-officio a member of all committees without the right to vote.

Auditing

Sec. 2. The Auditing Committee shall consist of two members of the Association appointed by the Executive Committee. This committee shall audit the accounts of the Treasurer and report at the annual meeting.

Entertainment

Sec. 3. The Entertainment Committee shall consist of seven members, four active and three associate, appointed by the President.

Topic

Sec. 4. The Topic Committee shall consist of three members appointed by the President.

ARTICLE IV.**Amendments.****Amendment**

These By-Laws may be amended by a two-thirds vote of the members present at the annual meeting.

STANDING RULES.

Order of Business

1. At all meetings of the Association the Order or Business shall be as follows:

- 1 Registration of members present.
- 2 Consideration of minutes.
- 3 Addresses,
- 4 Announcements,
- 5 Election of members,
- 6 Reports of officers,
- 7 Report of Executive Committee,
- 8 Reports of Standing Committees,
- 9 Reports of Special Committees,
- 10 Unfinished business,
- 11 New business (including papers and their discussion),
- 12 Election of officers,
- 13 Installation of officers,
- 14 Adjournment.

Printing of

2. Papers for presentation at the annual meeting must be prepared and in the hands of the Chairman of the Topic Committee sufficiently early to permit of the Secretary having same printed and distributed to the members fifteen days before the annual meeting convenes.

Restriction

3. No patentees or their agents, nor manufacturers or their representatives shall occupy the attention of the meeting with matter pertaining to the article which they may represent or handle, unless they are especially invited to do so by the Executive Committee when such article forms a part of the subject matter under discussion for that particular meeting.

Published Proceedings

4. A copy of the Constitution, By-Laws and Standing Rules, also an alphabetical list of the members showing their full name, address and official title, shall be published in the proceedings of the annual meeting.

Amendment

5. These Standing Rules may be amended or suspended at any meeting of the Association by a two-thirds vote of the members present.

LIST OF ACTIVE MEMBERS

W. W. Ashald, Supt. Tel., G. T.....	Montreal, Que.
B. B. Baughman, Supt. Tel., W. & L. E.....	Canton, O.
Wm. Bennett, Supt. Tel., C. & N. W.....	Chicago, Ill.
F. E. Bentley, Supt. Tel., T. R. R. Assn.....	St. Louis, Mo.
J. H. Brennan, Asst. Supt. Tel., St. L. & S. F.....	St. Louis, Mo.
H. L. Bennett, Supt. Tel., H. & T. C.....	Houston, Tex.
George Boyce, Supt. Tel., C. St. P. M. & O.....	St. Paul, Minn.
F. G. Boyer, Supt. Tel., N. T. Co.....	Oil City, Pa.
S. K. Bullard, Supt. Tel., M. K. & T.....	Denison, Tex.
W. J. Camp, Elec. Engr., Can. Pacific.....	Montreal, Que.
G. A. Cellar, Supt. Tel., Pa. Lines W. of P.....	Pittsburgh, Pa.
E. A. Chenery, Supt. Tel., Mo. Pac.....	St. Louis, Mo.
J. P. Church, Chief Clerk, Wabash.....	Decatur, Ill.
W. P. Cline, Supt. Tel., A. C. Line.....	Wilmington, N. C.
W. L. Connelly, Supt. Tel., C. I. & S.....	Gibson, Ind.
J. L. Davis, Supt. Tel., C. & E. I.....	Chicago, Ill.
E. W. Day, Asst. Supt. Tel., B. & O.....	Baltimore, Md.
E. E. Dildine, Asst. Supt. Tel., Nor. Pac.....	St. Paul, Minn.
G. A. Dornberg, Genl. Foreman, Pa. Lines W. of P...	Pittsburgh, Pa.
P. W. Drew, Supt. Tel., M. St. P. & S. S. M.....	Chicago, Ill.
I. T. Dyer, Supt. Tel., S. P. L. A. & S. L.....	Los Angeles, Cal.
J. B. Fisher, Supt. Tel., Penna.....	Philadelphia, Pa.
L. B. Foley, Supt. Tel., D. L. & W.....	New York, N. Y.
A. S. Foote, Genl. Foreman, Sunset Lines.....	Houston, Tex.
S. A. D. Forristall, Supt. Tel., B. & M.....	Boston, Mass.
B. F. Frobes, Supt. Tel., O. S. L.....	Salt Lake City, Utah.
U. J. Fry, Supt. Tel., C. M. & St. P.....	Milwaukee, Wis.
J. W. Fry, Asst. Supt. Tel., C. M. & St. P.....	Seattle, Wash.
C. H. Gaunt, Supt. Tel., A. T. & S. F.....	Topeka, Kas.
O. C. Greene, Supt. Tel., Nor Pac.....	St. Paul, Minn.
E. P. Griffith, Supt. Tel., Erie.....	Jersey City, N. J.
T. R. Gooch, C. T. Despr., R. F. & P.....	Richmond, Va.

G. H. Groce, Supt. Tel., Ill. Central.....Chicago, Ill.
 J. G. Hampton, Supt. Tel., No. Amn. T. Co.....Deseronto, Ont.
 A. Hatton, Inspr. of Trans., C. P.....Winnipeg, Man.
 J. L. Henritz, Supt. Tel., C. & S.....Denver, Col.
 Percy Hewett, Supt. Tel., Sunset Lines.....Houston, Tex.
 Otto Holstein, C. T. Despr., Central Ry. of Peru.....Lima, Peru.
 J. G. Jennings, Supt. Tel., C. R. I. & P.....Chicago, Ill.
 F. T. Jennings, Supt. Tel., C. P.....North Bay, Ont.
 W. M. Johnson, Jr., Train Despr., B. & L. E.....Greenville, Pa.
 W. B. Jones, Supt. Trans., C. I. & L.....La Fayette, Ind.
 L. M. Jones, Asst. Supt. Tel., A. T. & S. F.....Topeka, Kas.
 G. C. Kinsman, Supt. Tel., Wabash.....Decatur, Ill.
 V. T. Kissinger, Asst. Supt. Tel., C. B. & Q.....Lincoln, Neb.
 Wm. Kline, Supt. Tel., L. S. & M. S.....Toledo, O.
 E. A. Klippel, Supt. Tel., O. R. & N.....Portland, Ore.
 C. L. Lathrop, Supt. Tel., P. S. & N.....Angelica, N. Y.
 L. A. Lee, Supt. Tel., P. & L. E.....Pittsburgh, Pa.
 C. M. Lewis, Supt. Tel., P. & R.....Reading, Pa.
 E. J. Little, Supt. Tel., Gt. Nor.....St. Paul, Minn.
 R. L. Logan, Supt. Tel., K. C. Sou.....Kansas City, Mo.
 E. E. McClintock, Supt. Tel., C. & W.....Denver, Colo.
 W. P. McFarlane, Asst. Supt. Tel., C. & N. W.....Omaha, Neb.
 J. McMillan, Supt. Tel., C. P.....Calgary, Alba.
 M. Magiff, Supt. Tel., Cent. Vt.....St. Albans, Vt.
 M. W. Maguire, Supt., N. & S.....Norfolk, Va.
 W. Marshall, Supt. Tel., C. P.....Toronto, Ont.
 W. S. Melton, Supt. Tel., Q. & C.....Lexington, Ky.
 C. W. L. Mickley, Supt. Tel., I. & G. N.....Palestine, Tex.
 C. A. Parker, Supt. Tel., D. N. W. & P.....Denver, Colo.
 E. A. Patterson, Asst. Supt. Tel., C. M. & St. P....Milwaukee, Wis.
 C. B. Phelps, Supt. Trans., L. & N.....Louisville, Ky.
 W. H. Potter, Supt. Tel., Southern.....Washington, D. C.
 F. S. Rawlins, Supt. Tel., Sou. Pac.....San Francisco, Cal.
 E. F. Raymond, Asst. Supt. Tel., Sou. Pac.....San Francisco, Cal.

Geo. Reith, Supt., Virginia.....Norfolk, Va.
 C. S. Rhoads, Supt. Tel., C. C. C. & St. L.....Indianapolis, Ind.
 J. F. Richardson, Supt. Tel., C. P.....Montreal, Que.
 Thos. Rodger, Inspector Tel., G. T.....Montreal, Que.
 Geo. Rooke, Inspector Train Desp., C. P.....Montreal, Que.
 A. E. Roush, Gen. Foreman, P. & L. E.....Pittsburgh, Pa.
 W. W. Ryder, Supt. Tel., C. B. & Q.....Chicago, Ill.
 C. Selden, Supt. Tel., B. & O.....Baltimore, Md.
 J. B. Sheldon, Supt. Tel., Union Pac.....Omaha, Neb.
 F. G. Sherman, Supt. Tel., C. R. R. of N. J.....New York.
 C. F. Smith, Supt. Tel., C. & A.....Bloomington, Ill.
 N. E. Smith, Supt. Tel., N. Y., N. H. & H.....New Haven, Conn.
 F. W. Smith, C. T. Despr., B. & L. E.....Greenville, Pa.
 F. S. Spafard, Asst. Supt. Tel., C. R. I. & P.....Chicago, Ill.
 J. S. Stevens, Supt. Tel., C. & O.....Richmond, Va.
 John Tait, Supt. Tel., C. P. E.....Winnipeg, Man.
 A. B. Taylor, Supt. Tel., N. Y. C. & H. R.....New York.
 W. K. Tasker, Supt. Tel., P. M.....Detroit, Mich.
 H. D. Teed, Supt. Tel., St. L. & S. F.....St. Louis, Mo.
 B. F. Thompson, Tel. Inspr., B. & O.....Baltimore, Md.
 G. C. Todd, Supt. Tel., N. Y. C. & St. L.....Cleveland, O.
 Frank Trimble, Supt. Tel., T. & P.....Dallas, Texas.
 H. A. Tuttle, Gen. Supt. Tel., M. St. P. & S. S...Minneapolis, Minn.
 S. L. Van Akin, Asst. Supt. Tel., N. Y. C. & H. R..Syracuse, N. Y.
 F. H. Van Etten, Supt. Tel., Sou. Ind.....Chicago, Ill.
 J. M. Walker, Supt. Tel., D. & R. G.....Denver, Colo.
 W. C. Walstrum, Supt. Tel., N. & W.:.....Roanoke, Va.
 B. Weeks, Asst. Supt. Tel., Ill. Cent.....Memphis, Tenn.
 L. S. Wells, Supt. Tel., Long Island.....Long Island City, N. Y.
 F. T. Wilbur, Asst. Supt. Tel., Ill Cent.....Chicago, Ill.
 W. F. Williams, Supt. Tel., S. A. Line.....Portsmouth, Va.
 W. H. Wright, C. T. Despr., W. & M.....Peshtigo, Wis.
 R. N. Young, Asst. Supt. Tel., C. P.....Winnipeg, Man.
 J. J. Ross, Supt. Tel., Mich. Cent.....Detroit, Mich.

ASSOCIATE MEMBERS

W. E. Bell.....	Chicago.
R. D. Brixie.....	New York.
A. E. Barry.....	Philadelphia.
C. E. Brown.....	Chicago.
A. N. Bullens.....	Boston.
H. P. Clausen.....	Chicago.
A. D. Cloud.....	Chicago.
A. B. Conover.....	Chicago.
J. H. Crossman, Jr.....	Harrisburg, Pa.
H. D. Crouch.....	Montreal, Que.
W. F. Crowell.....	New York.
M. M. Davis.....	New York.
Geo. M. Dodge.....	Valparaiso, Ind.
Albert Douglas.....	Chicago.
A. P. Eckert.....	New York.
N. R. Fill.....	St. Louis.
H. B. Folsom.....	Circleville, O.
F. F. Fowle.....	Chicago.
M. F. Geer.....	Rochester, N. Y.
J. J. Ghegan.....	New York.
J. S. Gibson.....	Rochester, N. Y.
Edwin R. Gill.....	New York.
Chas. S. Hague.....	Rochester, N. Y.
W. E. Harkness.....	New York.
T. S. Hemingway.....	Buffalo, N. Y.
Alex. Henderson.....	Boston, Mass.
F. C. Hirsch.....	Montreal.
S. Johnson.....	New York.
B. A. Kaiser.....	New York.
J. C. Kelsey.....	Chicago.
O. T. Lademan.....	Chicago.
John Langan.....	New York.
M. E. Launbranch.....	New York.
E. C. Lewis.....	Chicago.
J. M. Lorenz.....	Chicago.
H. E. Merrill.....	New York.
P. W. Miller.....	New York.
H. P. Miller.....	Newark, N. J.
Jay G. Mitchell.....	Cleveland, O.
Val. B. Mintun.....	Kansas City.
F. H. Reed.....	New York.
H. O. Rugh.....	Sandwich, Ill.
B. H. Shepard.....	Syracuse, N. Y.
A. W. Stavlev.....	Toronto, Ont.
H. C. Slemm.....	Rochester, N. Y.
M. C. Stern.....	Dayton, O.
Henry M. Sperry.....	New York.
K. M. Turner.....	New York.
E. W. Vogel.....	Chicago.
J. V. Watson.....	Chicago.
Archibald Wray.....	Chicago.
G. F. Wiley.....	Philadelphia.
B. L. Winchell, Jr.....	Chicago.

HONORARY MEMBERS

Thos. A. Edison

John B. Taylor

T. D. Lockwood

Ralph W. Pope

J. C. Barclay

J. B. Stewart

A. J. Earling

C. H. Bristol

C. E. Freeman

Wm. Maver, Jr.

Geo. C. Maynard

W. K. Morley

F. P. Valentine

W. E. Gilmore

H. V. Miller

H. F. Houghton

J. F. Wallick

J. Levin

J. R. Terhume

James Kent

G. F. Weldman

J. H. Jacoby

G. M. Dugan

W. J. Holton

Wendell Baker

L. H. Korty

R. C. Clowry

W. C. Brown

Geo. W. Stevens

Marvin Hughitt

W. M. Greene

T. P. Cook

F. S. Gannon

Geo. T. Williams

Belvidere Brooks

I. N. Miller

T. R. Taltavall

J. W. Fortune

W. J. Murphy

C. D. Gorham

Charles McLaughlin

J. B. Taltavall

E. A. Smith

C. G. Sholes

A. R. Swift

E. Borden

F. E. Clary

C. A. Darlton

C. F. Annett

Geo. L. Lang

F. A. C. Gerguson

H. C. Sprague

**Minutes of the Proceedings of the
Twenty-eighth Annual Convention,
Association of Railway Telegraph
Superintendents, held at Detroit,
Mich., June 23rd, 24th and 25th,
1909.**

HOTEL PONCHARTRAIN DETROIT, MICH.

FIRST DAY—MORNING SESSION.

(Wednesday, June 23, 1909).

The Convention was called to order at 10:15 A. M., the President, Mr. W. J. Camp, C. P. Ry., Montreal, Can. being in the chair.

There were present:

- Angelica, N. Y.—C. L. Lathrop.
Baltimore, Md.—Charles Selden and wife, and B. F. Thompson.
Boston, Mass.—A. N. Bullen and S. A. D. Forristall.
Brooklyn, N. Y.—A. F. Armsbee.
Calgary, Alb.—J. McMillan and wife.
Canton, O.—B. B. Baughman.
Chicago—C. M. Baker, W. E. Bell. William Bennet and wife, T. W. Carroll, A. D. Cloud, John L. Davis and wife, P. W. Drew and wife, Albert Douglas, A. G. Francis, wife and two sons; G. H. Groce, J. E. Ham, C. L. Howk, G. A. Joy, J. C. Kelsey, M. E. Launbranch, E. C. Lewis, J. M. Lorenz, E. Parliment, G. H. Porter, W. W. Ryder and wife, W. H. Singluff, F. H. Loveridge, O. T. Lademan, F. H. Van Etten, E. W. Vogel, J. V. Watson, F. T. Wilbur and B. L. Winchell, Jr.
Cincinnati, O.—Phillip Case, F. C. Ketzler, I. N. Miller and M. S. Rosenthal.
Circleville, O.—H. P. Folsom.
Dayton, O.—Milton C. Stern.
Decatur, Ill.—G. C. Kinsman wife and daughter.
Denver, Colo.—E. E. McClintock.
Detroit, Mich.—C. Corbett and daughter, T. W. McGary and wife, A. von Schlegell, Wm. K. Tasker and G. M. Wehl.
Elyria, O.—A. D. T. Libby and A. B. Smith.
Gibson, Ind.—W. L. Connelly.
Houston, Tex.—A. S. Foote and Percy Hewett.
Indianapolis, Ind.—C. S. Rhoads and wife.
Jackson, Miss.—E. E. Torrey.
Jersey City, N. J.—E. P. Griffith, wife and son.
Kansas City, Mo.—R. L. Logan and V. B. Mintun.
LaFayette, Ind.—W. B. Jones, C. T. McHugh, and E. G. Stradling.
Lincoln, Neb.—V. T. Kissinger and wife, and Mrs. A. V. Cornish.
Los Angeles, Calif.—I. T. Dyer.
Memphis, Tenn.—B. Weeks.
Milwaukee, Wis.—U. J. Frey and G. S. Burnett.

Minneapolis, Minn.—L. H. Merrill.

Montreal, Que.—W. W. Ashald and wife, W. J. Camp and wife, H. D. Crouch, Miss Jennings, T. Rower and wife, G. T. Rooke and A. B. Smoth.

Newark, N. J.—H. P. Miller.

New York.—F. A. Baker, R. E. Butrick, W. F. Crowell, H. E. Dunham, J. J. Ghegan, E. R. Gill, J. B. Given, W. E. Harkness, wife and daughter; W. G. Hovey, B. A. Kaiser, J. T. Kinder, John Langan, H. E. Merrell, P. W. Miller, F. G. Sherman and wife, G. W. Swan, J. B. Taltavall and wife, A. B. Taylor and wife, and R. F. Spaw.

North Bay, Ont.—F. T. Jennings.

Oil City, Pa.—F. G. Boyer.

Omaha, Neb.—W. B. Farlane and wife and J. B. Sheldon and wife.

Ottawa, Ont.—C. E. Davies.

Philadelphia, Pa.—J. B. Fisher and J. O. Oliver.

Pittsburg, Pa.—G. A. Cellar, G. A. Dornberg, L. A. Lee and A. E. Roush.

Port Huron, Mich.—E. J. Cornell.

Portsmouth, Va.—W. F. Williams, wife and two daughters.

Quebec, Que.—E. Pope.

Richmond, Va.—T. R. Gooch and J. S. Stevens.

Rochester, N. Y.—R. F. Button, M. F. Geer, J. F. Gibson, C. E. Hague, G. D. Morgan, E. O. Munson and W. W. Salmon.

Sandwich, Ills.—E. Parsons, C. S. Rhoads, Jr., and H. O. Rugh.

San Francisco, Cal.—E. F. Raymond and wife.

St. Paul, Minn.—George Boyce and O. C. Greene.

Schenectady, N. Y.—J. B. Taylor.

St. Louis, Mo.—E. A. Chenery and wife, and N. R. Fill.

Syracuse, N. Y.—Bert H. Shepard.

Trenton, N. J.—R. R. Newell.

Toledo, O.—William Kline.

Toronto, Ont.—W. J. Duckworth, William Marshall, I. McMichael and A. W. Stavely and wife.

Valparaiso, Ind.—G. M. Dodge.

Wilmington, N. C.—W. P. Cline.

In opening the proceedings the President said:

Gentlemen: I need hardly say that I am very much pleased indeed to have such a very large attendance at this meeting.

The Mayor of the city and the Vice-President of the Board of Commerce will be here presently. In the meantime, however, as we have a great deal of work to do during this session we will proceed with the formal work usual on the opening of the meetings, such as Secretary's report, reading of the minutes, etc.

Secretary: The first thing, gentlemen, is the election of new members. Any who have not handed in their applications, however, can do so later in the meeting, when their names will be added to the list.

Mr. President: I have the honor to report the following names for membership:

NEW MEMBERS.

ACTIVE.

Wm. Bennett, Supt. Tel., C. & N. W. Ry.....Chicago, Ill.
 H. L. Bennett, Supt. Tel., H. & T. C. Ry.....Houston, Tex.
 Jas. H. Brennan, Asst. Supt. Tel., St. L. & S. F. Ry...St. Louis, Mo.
 J. W. Fry, Asst. Supt. Tel., C. M. & St. P. Ry.....Seattle, Wash.
 T. R. Gooch, Chief Train Dspr., R. F. & P. Ry.....Richmond, Va.
 Otto Holstein, C. T. Despr., Central Ry. of Peru..Lima, Peru, S. A.
 W. B. Jones, Supt. Trans., C. I. & L. Ry.....LaFayette, Ind.
 L. A. Lee, Supt. Tel., P. & L. E. Ry.....Pittsburgh, Pa.
 J. McMillan, Supt. Tel., C. P. R.....Calgary, Alb.
 C. W. L. Mickley, Supt. Tel., I. & G. N.....Palestine, Tex.
 E. F. Raymond, Asst. Supt. Tel., Sou. Pac.....San Francisco, Cal.
 John F. Richardson, Supt. Tel., C. P. R.....Montreal, Que.
 A. E. Roush, Genl. Foreman, P. & L. E.....Pittsburgh, Pa.
 C. F. Smith, Supt. Tel., C. & A.....Bloomington, Ill.
 John Tait, Supt. Tel., C. P. R.....Winnipeg, Man.
 W. K. Tasker, Supt. Tel., P. M. Ry.....Detroit, Mich.
 B. F. Thompson, Inspector Telephones, B. & O. Ry..Baltimore, Md.
 Frank Trimble, Supt. Tel., T. & P.....Dallas, Tex.
 F. T. Wilbur, Asst. Supt. Tel., Ill Cent.....Chicago, Ill.
 W. H. Wright, Chief Train Dspr., W. & M.....Peshtigo, Wis.

ASSOCIATE.

W. E. Bell, Div. C. Supt., Am. Tel. & Tel. Co.....Chicago, Ill.
 A. E. Berry, Div. Mgr. Bell Tel. Co. of Pa.....Philadelphia, Pa.
 A. D. Cloud, Ass. Editor Signal Engr.....Chicago, Ill.

J. H. Crosman, Jr., Div. Mgr. Bell Tel. Co. of Pa...Harrisburg, Pa.
 Albert Douglas, Spl. Agt. Am. Tel. & Tel. Co.....Chicago, Ill.
 N. R. Fill, Spl. Agt. A. T. & T. Co.....St. Louis, Mo.
 H. B. Folsom, Sec. & G. M. Universal P. & P. Co..Circleville, O.
 M. F. Geer, Sales Engr. Gen. Ry. Sig. Co.....Rochester, N. Y.
 J. S. Gibson, Ry. Sales Dept., S. C. Tel. Mfg. Co..Rochester, N. Y.
 Chas. E. Hague, Chf. Engr., S. C. Tel. Mfg. Co.....Rochester, N. Y.
 O. T. Lademan, Ry. Tel. & Elec. Co.....Chicago, Ill.
 J. H. Lorenz, Cent. Elec. Co.....Chicago, Ill.
 H. P. Miller, N. Y. & N. J. Tel. Co.....Newark, N. J.
 V. B. Mintun, Mo. & Kan. Tel. Co.....Kancas City, Mo.
 A. W. Stavely, Norton Tel. Co.....Toronto, Ont.
 B. L. Winchell, Jr., V. P. Watson Ins. Wire Co.....Chicago, Ill.
 K. M. Turner, Pres. Nat'l Dictograph Co., 1265 Bdway..New York.
 M. C. Stern, Gen. Mgr., The Egly Register Co.....Dayton, O.
 M. M. Davis, Elec. Engr. Postal Tel. Co.....New York.

Secretary: Mr. President, I move that these Active and Associate members respectively be made members of this Association.

Which motion being duly seconded was carried.

President: I take very much pleasure, then, in declaring them elected members of this Association, and I think you will all feel gratified to know that we have such a large increase in our membership—20 Active and 18 Associate members.

Mr. Hall: Mr. President, Ladies and Gentlemen: I have the honor of introducing to you our Mayor, Mr. Breitmeyer.

Mayor Breitmeyer: Ladies and Gentlemen: It is my pleasant duty this morning—though getting somewhat wet under the collar, which is, however, something anybody cannot help—to welcome you this morning at your convention.

I feel a good deal like the man said yesterday, "That Detroit's all right for a convention city, but it oughtn't to have seven conventions in one day." When I see these ladies in the rear here, I want to congratulate them, because I know they have been taken care of.

Now we in Detroit, as you know, are a convention city, and we, as people, like to have you come. In the first place, we need your money; we need it more than anything else, and we are especially adapted to do all that anybody else can do, and a great deal more than anybody else can do, that is, to give you some place to go. With this weather as it happens today, I do not blame you at all for not sitting in this room very long, no matter how important your business is; but you have a substitute, you can go on the River. There is no River like it anywhere, and there are no boats like ours anywhere, so that you can all have a good time.

I, for the first time the other day, had the pleasure of an invitation to visit the Michigan Central here and to see how the work was really done. I always felt anxious to know who was in charge, and who is taking care of these many lines who travel through our country, and I am especially pleased this morning to meet these men who have that work in charge. I had no idea that I could telegraph and telephone over one wire, and tell a man over here in Kalamazoo that I was starting away from here now on the train, and the accommodations on that train, and I appreciated very much to know just how this work was done.

I feel somewhat sad this morning too, to know that Mr. Millington, a man who has done so much for our city in installing this work, has passed away. Perhaps it is not a nice thing to bring it up here, but I feel that it is my duty to speak of him, as I knew of the work which he has done and which has so benefited us all who travel.

I am certainly pleased this morning, gentlemen, to meet you and greet you to the City of Detroit, to welcome you all, and I know that what the convention has not prepared for

you, in the way of entertainment, the City and citizens stand ready to do. I want you all to feel a hearty welcome for you. If anything is left undone that I can do to make your stay a pleasant one, aside from your business, I stand willing and ready to help you out. I want the committee to understand that, and I want you all to feel that if you don't have a good time, Detroit is ready for you at any time and will give you all that anybody would do.

I thank you very much.

President: Ladies and Gentlemen: You will please give your attention for a few minutes to Mr. Stevens, Vice-President of the Board of Commerce, who has a few words to say to you.

Mr. Stevens: Mr. President, Ladies and Gentlemen: On a morning like this and in a room like this, I think the soul of hospitality should be tempered with the spirit of brevity.

I have been introduced as Vice-President of the Board of Commerce. The President and Vice-President are away, consequently I appear here as a substitute, as a minor official. You know in military life a good soldier is one who obeys his superior officer, and I think that rule also applies in all departments of railway transportation.

The Board of Commerce, I will say, is now out of its swaddling clothes. It never had any infancy in fact. Like Topsy, it sprang into activity. It is made up of two thousand business men like yourself, who form a part of the great machinery of commerce that moves the things of active business life. It has a very commodious building on the corner of Lafayette Boulevard and Shelby Street. The Secretary in particular you will find a very admirable gentleman who would be pleased to see you all and render any service that he can while you are here. The room is

provided with many desks, a good many telephones and typewriting machines and typewriting offices, and for the gentlemen we will be very glad to open up several bottles of—ink, and for the ladies we will be very glad indeed to give them—attention.

We had thought, on account of the tunnel, which is in process of construction, that we would endeavor to have Mr. W. C. Brown, President of the N. Y. Central, here, but we found that he had gone abroad. We then tried to secure for a talk Mr. Hammond, but we found that he had gone abroad—and we realize at last, today, that while the President of the great railway corporations, and even of the Boards of Commerce, may go abroad, that the telegrapher, the man who “moves” things, the man who converts the peril of railroad travel into absolute safety, has to be pretty close to his job, consequently, ladies and gentlemen, Detroit is highly complimented and favored in having you with us, and if the Board of Commerce can render you any service, believe me, that individually or collectively we shall be most glad to do so.

Chairman: Ladies and Getleman: Will you kindly give your attention now to Mr. Fisher, the Vice-President of the Association, who will express the views of the Association in regard to our welcome here.

Mr. Fisher: Mr. Chairman, Messrs. Breitmeyer and Stevens: On behalf of the Association of Railway Telegraph Superintendents, I wish to express the hearty thanks of the Association for your very cordial welcome.

In looking over the history of this Association, I find that this is the 28th Annual Meeting. Twice before has it met in Detroit, and, while I cannot speak of personal knowledge, yet I will warrant the assertion that in the other two

meetings the reception was not as hot as this one. I heard a very rotund individual this morning quote this: "And his back was red with honest sweat," and I can heartily concur in that sentiment.

I do not know that I want to take up the time of this Association to any considerable extent in offering thanks. I believe we can honestly say that it goes without saying that we are very much gratified with the very warm reception we have here—I mean not from a weather standpoint now—and as these ladies want to get out, I will make myself exceedingly brief.

President: Ladies and Gentlemen: You will now please give your attention to Mr. Hall, of the Michigan Central R. R. who has so kindly taken on his shoulders a large part of the work which Mr. Millington would have looked after personally. Mr. Hall will give you a synopsis of the programme of entertainment laid out, more particularly for the ladies.

Mr. Hall. Mr. President, Ladies and Gentlemen: I am very sorry that Mr. Millington cannot express to you here personally the work of his committee, and I cannot find words to express my great sorrow at his having left us.

Your committee have tried to outline and to plan a pleasant and an interesting programme for you. Mrs. Kinman, Mrs. McGary and Mrs. Emery have been called in to help us to take care of the ladies in the place of Mrs. Millington, and the programme this morning is to meet down stairs at 10:50 and take the trolley cars to Palmer Park. Palmer Park is a rustic park presented to this city by the Honorable Thomas W. Palmer, and is really one of the most interesting and beautiful places to visit in the city, and I know that you will enjoy an hour there very much and find it cool and very pleasant.

On returning from Palmer Park, to the hotel, luncheon will be had about one o'clock, and the ladies will then start, at 2:30 promptly, for the steamer Columbia, which will start from the foot of Bates Street, about four blocks from this hotel, and the Detroit, Bell Isle and Windsor Ferry Company have very kindly extended the courtesy of their line to you for a trip down to Bois Blanc Island, a sail of nineteen miles down the Detroit River. It will give you a very delightful ride and a splendid idea of the many beauties of this portion of the river.

We have also arranged at the Casino at Bois Blanc Island for a dinner, which will be served about 15 or 20 minutes after your arrival, and returning, boat will leave that island about 6:15, reaching Detroit at eight o'clock. That will close the programme for today.

Tomorrow, Thursday, at nine o'clock sharp, we have arranged for some trolley cars which will start from the corner of Griswold and Congress Streets, which is two blocks from this hotel, which will take you out to Mount Clemens, 21 miles north of Detroit, and they will follow the route of Lake St. Clair on the way out, through the prettiest part of the residence portion of this city, and through quite a portion of the country where our best citizens are and have their summer homes. You will be met at Mount Clemens by a committee there of Mount Clemens citizens, who are very hospitable and who will show you their little city and some of the greatest bath houses in America, where they cure all kinds of rheumatism and things of that sort. Coming back cars will reach the hotel here at one o'clock.

In the afternoon at 2:30 some sight-seeing automobiles will meet you on the Park side of the Hotel and will proceed

out Woodward Avenue and around the Boulevard; thence to Water Works Park; thence around Belle Isle, stopping at the Aquarium, and thence to the Casino. We expect to reach the Casino about 5:15.

At 5:30 all the ladies and gentlemen of the Association are to meet at the Casino and a picnic in the woods has been prepared on the lawns and under the trees in front of the Casino. It was thought by your Committee that after a hard day's work which the members no doubt will have, it will be a very delightful thing to get out under the canopy of heaven and have a real nice dinner. That will end the programme for Thursday.

On Friday, at nine o'clock sharp, from the Brush Street station of the Grand Trunk Railway, a special train will convey you to Port Huron, which is at the mouth of the St. Clair River, in sight of Lake Huron, a very pretty sight. There we will inspect the great international tunnel, which the Grand Trunk Railroad built some years ago. After this inspection we will be taken to the Hotel Harrington by special train. We will have a light luncheon there and will then leave Port Huron at 3:45 in the afternoon for a sail down the Saint Clair River, through Lake Saint Clair and the Detroit River, home, arriving here at eight o'clock.

Arrangements have been made for a dinner on board the steamer *Tashmoo*, which is one of the finest passenger steamers afloat anywhere. The White Star Line have extended the courtesies of their line to the members of the organization and their wives and children.

One of our finest photographers, in Detroit, Mr. C. M. Hayes, will photograph the entire party on Belle Isle, at 5:30 on Thursday afternoon, so we would like to have everybody there.

In connection with the transportation, on account of the recent laws passed by the states and the United States, I regret very much to say that we are unable to issue free transportation to any but the active members of the organization. The boat line people would like very much, of course, to open up their boats to every member, both active and associate, but that they are unable to do by reason of these restricting laws, and for the information of the associate members and their friends I would like to say that the local fare between Detroit and Port Huron is \$1.14 by rail; the steamboat fare from Port Huron to Detroit on the White Star Line is 75c and the fare from Detroit to Bois Blanc and return is 35c. We are awfully sorry that these laws are such that they won't admit us to take all our friends and associate members.

Tickets for the special dinners and the boat rides and the automobile ride are in the hands of Mr. C. W. Mercer, just outside the door. Mr. Mercer is especially adapted to taking care of the ladies, and will give up his entire time to their pleasure and comfort during the time that you are here. He will be ably assisted by Mr. Frank Hopper. Mr. Mercer is connected with the Michigan Central, and Mr. Hopper is connected with the Grand Trunk; they are both very nice men and I am sure will do everything they can to make it pleasant for you. I would like to ask you, to help your committee out, if you will, by calling upon Mr. Mercer for your tickets at the earliest possible moment, because, in order to make arrangements with these different people, we must know the exact number that we shall have, and it will be very much appreciated if you can secure these tickets this morning from Mr. Mercer.

Mr. Davis: Mr. Chairman, I move that a vote of thanks be extended to the gentlemen, who have prepared the very excellent programme of entertainment for us and friends.

The motion, being duly seconded by Mr. Fisher, was carried.

President: Mr. Hall, in behalf of the Association, I have to tender you and the members of your committee and those who have so kindly associated themselves with them, the hearty thanks of the Association for the very elaborate programme that you have prepared.

President: The Secretary has some announcements to make.

Secretary: We have several letters which I will read.
Mr. W. J. Camp, Esq.,

President, Association of Railway Telegraph Superintendents, care Canadian Pacific Railway, Montreal, Que.

Dear Sir: Replying to your letter of the 5th instant, I beg to say that it will afford us pleasure to extend the usual free privileges to members of the Association of Railway Telegraph Superintendents to attend the annual meeting of that Association to be held at Detroit, June 23rd to 25th, inclusive, and suitable instructions have been given to our office at that point.

Thanking you heartily for your kind invitation to attend the meeting, which I regret I find it impossible to do, I am,

Yours truly,

R. C. CLOWRY, President.

Mr. W. J. Camp,

President, Association Railway Telegraph Superintendents, Montreal, Canada.

Dear Sir: This company takes great pleasure in extending to the delegates attending the Annual Meeting of the Association of Railway Telegraph Superintendents, the use of its lines for personal and social messages during the

session at the Hotel Pontchartrain, Detroit, Mich., June 23rd, 24th and 25th.

Thank you also for the cordial invitation to myself and staff to attend the session. If it is possible for some member to do so we will gladly arrange it.

I have been interested for a number of years in the printed reports of your annual meetings, and I record the plain truth when I say that I know of no similar organization whose annual meetings are so business-like, and whose members accomplish more real work. This annual exchange of ideas and experience which is so freely and splendidly done at your meetings can not help but result in tremendous good to all concerned.

Wishing you the usual and successful, happy meeting, and with personal regards and good wishes,

Very truly yours,

E. J. NALLY.

Vice-President and General Manager.

Cleveland, May 15th, 1909.

Mr. W. J. Camp, President,

Association of Railway Telegraph Supts.

Canadian Pacific Railway Co.'s Telegraph,
Montreal, Que.

Dear Mr. Camp: It is a pleasure to me to inform you that I am authorized to extend to your Association the usual free telegraph privileges during your coming annual meeting at Detroit. I will go over to Detroit very soon and make necessary arrangements so far as this Company is concerned, and will be glad to receive from you any suggestion as to the manner of taking care of the telegrams of persons attending your meeting.

Very respectfully,

J. FITZPATRICK, Supt.

Toronto, Ont., May 6th, 1909.

Mr. W. J. Camp, President,
Association of Ry. Supts. of Telegraph, care C. P. R.
Co.'s Telegraphs, Montreal, Que.

Dear Sir: Replying to your letter of the 5th inst., I beg to say that this Company will be glad to extend the usual free privileges over our lines to the members of your Association at the Annual Meeting which will take place at Detroit on June 23rd, 24th and 25th. I will try and arrange if possible, to attend the meeting personally.

Yours truly,

I. McMICHAEL, General Manager.

Montreal, 17th May, 1909.

W. J. Camp, Esq., Electrical Engineer.

Dear Sir: I beg to acknowledge receipt of your letter of the 5th instant informing me of the annual meeting of the Railway Telegraph Superintendents to take place at the Hotel Pontchartrain, Detroit, on the 23rd, 24th and 25th, prox., and have much pleasure in extending to the members of the Association the privilege of free telegraphing over the lines of this Company during the dates mentioned.

I thank you most cordially for your kind invitation to attend and shall certainly endeavor to avail myself of the opportunity to do so.

Yours truly,

JAS. KENT, Manager Telegraphs.

Detroit, Mich., May 19, 1909.

Mr. W. J. Camp, President,
Association of Railway Telegraph Superintendents,
Montreal, Quebec.

Dear Sir: Referring to your letter of May 5th and my reply thereto of May 8th, I quote below from a letter dated

May 14th from Mr. W. E. Bell, Division Commercial Superintendent of the American Telephone and Telegraph Company:

“Replying to your letter of May 8th, with which you enclose a letter from the President of the Association of Railway Telegraph Superintendents requesting complimentary service during their convention to be held in Detroit on June 23d, 24th and 25th, I wish to advise the use of its lines to the above Association between the hours of 6 P. M. and 9 A. M. from the Hotel Pontchartrain on the dates mentioned.”

Yours very truly,

B. W. TRAFFORD,

Vice-President and General Manager.

Montreal, May 22nd, 1909.

W. J. Camp, Esq., President,
Association of Railway Telegraph Superintendents,
C. P. R. Telegraph Building, Montreal.

Dear Sir: Referring to your letter of May 5th, to our General Manager. This is to advise you that this Company will extend the use of its lines to the members of the Association of Railway Telegraph Superintendents from the Hotel Pontchartrain, Detroit on June 23rd, 24th and 25th, between the hours of 6 P. M. and 9 A. M.

I am advised that the American Telephone and Telegraph Company and the Michigan State Telephone Company will do likewise and that the Michigan State Telephone Company will also provide free local service in Detroit.

Your truly,

C. F. SISE, JR., General Superintendent.

Detroit, Mich, June 21st, 1909.

Mr. W. J. Camp, President,
Association Railway Telegraph Superintendents,
Detroit, Mich.,

Dear Sir: The Postal Telegraph-Cable Company takes pleasure in extending to the members of your Association the use of its lines for their personal social messages during the convention, and I will be glad to have you cause announcement to be made at the opening meeting.

Yours very truly,
H. J. KINNUCAN, Superintendent.

Chicago, Ill., May 10, 1909.

Mr. W. J. Camp,
President Ass'n. Ry. Tel. Supts., care C. P. Ry. Co.'s
Telegraph, Montreal, Quebec.

Dear Mr. Camp: I beg to acknowledge receipt of yours of the 8th, extending an invitation to the Convention of Railway Telegraph Superintendents, to be held in Detroit the latter part of June.

I thank you very kindly, and assure you that provided business conditions will permit, you can count on me being there. I have always had a desire to attend one of these very interesting meetings.

Sincerely,
T. W. CARROLL.

Secretary: Please fill up your attendance card so that we will know who you are. Everybody in attendance should have one of these cards. Mr. Kaiser will take these cards and he will fill out these free transportation cards for the telephone privileges, but it is very important that everybody have these cards filled out, not only for this purpose,

but that we may have your name properly in the report of the meeting.

President: The next business to take up is the reading of the minutes of regular and special meetings.

Mr. Selden: Mr. President, I move that the minutes be taken as read and approved.

This motion being duly seconded by Mr. Williams, was carried.

President Camp: In the order of procedure, there is no provision made for any lengthy address by the president of the Association, so I have just a few words to say and I will cut them short.

As Mr. Fisher stated, this is the 28th Annual Meeting. We met in Detroit in 1884, in 1900, making this the third meeting in this city, the first city outside of Chicago to hold that distinction. During the year the Western Committee held meetings in September in Chicago, December at St. Paul, and I think it was in February in St. Louis. The Eastern Committee held a November meeting in New York, and in April one in Philadelphia. You have all received the minutes of the four of these meetings, therefore it is not necessary for me to make any further report in that respect.

On account of Mr. Dailey, our Vice-President elected at the last annual meeting being transferred from the telegraph to the operating department, it became necessary for the Executive Committee to appoint a successor. In view of the fact that Mr. Fisher seemed to have very largely the confidence of the Association at the last election, the Executive Committee offered him the Vice-Presidency, which he was pleased to accept, and as you were duly notified.

I regret to announce that during the year we have lost four of our members by death, Mr. Harry Hope, whom we

all knew well, of the Omaha Road; Mr. Hoop was President in 1904, he was a charter member; then there was Mr. C. P. Adams, of the Southern, who joined the Association in 1895, when it met in Montreal—he was then with the Great Northern, I understand; then there was Mr. P. W. Snider, who only joined the Association last year, but was well known and well liked in the part of the country in which he has made his home for the past 30 years; lastly, we had Mr. Millington,—it is hardly necessary for me to say anything regarding him, as that will come up later. It has been suggested in a committee meeting we held last night that this Association will appoint a committee, if we may call it so, to attend the funeral of Mr. Millington, which takes place in St. Thomas, Ontario, to-morrow at 2:30 P. M., Eastern time, which is 1:30 P. M., Detroit time; that during the time that the funeral is taking place we will hold a special session of the Association here devoted entirely to resolutions of sympathy etc., regarding the death of these four members. As regards the committee suggested, two gentlemen have already volunteered to serve on that committee and go to St. Thomas, but since then I find that the associated roads, the New York Central and other roads intend to have all their representatives here go over to the funeral; is that right, Mr. Rhoads?

Mr. Rhoads: I will speak for the New York Central System; I understand they want all of us to attend the funeral.

President: Can you inform us about how many there are already present at this meeting?

Mr. Rhoads: Mr. Taylor, Mr. Kline, Mr. Lee, Mr. Connelly and myself.

President: For this meeting the Topic Committee have prepared a large number of papers, which will be announced to you shortly; some of them are very interesting indeed, and I expect there will be considerable discussion. We have also to take up the consideration of a complete revision of our Constitution and By-Laws. Up to within the past two years, the condensed form of constitution and by-laws have been found ample, but the scope of this organization has extended in so many different directions and has reached such importance that it has been realized by nearly all the members that it was necessary to have a more elaborate system of by-laws and constitution. The proposed changes have been thoroughly threshed out by both the Western and Eastern committees, and unless we strike some snag we should be able to get through with that part very quickly. According to the announcement of Mr. Hall, we will only have two days actual session. We will be, informally, on the boat on Friday, but we have got to accomplish all our work here by to-morrow afternoon. The only way I think that we can do that is by holding an evening session. Somebody will have to make a motion regarding it.

That is all I have to say, except regarding the attendance or the absence of our late brother, Mr. Millington. If there are here many of the active members representing the New York Central interests, perhaps it will not be necessary to appoint a special committee; I understand they are going down in a body as representing the railroad, but at the same time they could represent us; however, that matter is entirely within your hands.

Mr. Fisher: Mr. Chairman, inasmuch as the representatives of the New York Central Lines number about five persons, which would be a nice sized committee to attend

the funeral of Mr. Millington, I would offer as a motion that these gentlemen be asked to represent this Association as well as the New York Central Lines, at the funeral of Mr. Millington,—to be special representatives of this Association at the funeral.

This motion being duly seconded by Mr. Forristall, was carried.

President: I might say, gentlemen, when I learned yesterday of Mr. Millington's death, I ordered a floral tribute in the name of the Association to be procured in St. Thomas.

The next order of business is the report of the Treasurer.

TREASURER'S REPORT.

Chicago, Ill., June 23d, 1909.

Receipts.

On Hand June 24, 1908.....	\$ 4.00
Received for dues	640.00
Received for advertisements	240.00
Copy of Minutes sold.....	.35
Total	<hr/> \$884.35

Expenditures.

For Minutes of Montreal Meeting.....	\$287.20
For Minutes of Division Meetings, etc..	169.95
Postage, Express and Exchange.....	29.30
Printing Notices	16.50
Flowers, funerals of deceased members.	42.00
Badges	19.40
Secretary's Salary	300.00
Balance on hand	20.00
Total	<hr/> \$884.35

Respectfully submitted,

P. W. DREW,

Treasurer.

Mr. Selden: Mr. President, I move the acceptance of the report.

(The motion was duly seconded and carried.)

President: The next order of business is reports of standing committees. You have heard the report of the Committee on Arrangements. We will now take up the report of the Committee on Topics, of which Mr. Davis is Chairman.

Mr. Davis: Mr. Chairman, I have not seen a printed programme, although it was submitted to Mr. Taltavall in pieces and to Mr. Drew. I saw it up to the time that the last correction was made in it, and I think probably the programme itself speaks for the work of the Topic Committee and any remarks are unnecessary. I might say, however, that I have received a telegram from Mr. Van Akin saying it is impossible for him to prepare a paper; that telegram was received only yesterday, and knowing Mr. Van Akin as we do, it is quite probable that it has been impossible for very good reasons, but aside from that I believe the programme will be presented as printed; excepting also, I understand, indirectly, that Mr. Mayer has said that he has not prepared a paper for the reason that there are very few, or have been very few changes in developments of wireless telegraphy during the past few months; there are, however, in view at this time quite a few things of importance that may develop within the next few months. Mr. Mayer has very kindly consented to present a paper at our next annual meeting that will show what progress has been made up to that time.

President: Did I understand that the Telegraphic Age has the programme, Mr. Davis?

Mr. Davis: It is my understanding that the Telegraphic Age prints it just as it will be presented today, with the exceptions mentioned. I got in rather late this morning and have not had a chance to look it over.

President: Gentlemen, I think you have all been supplied with a copy of the Telegraph Age. You will find the list of topics on page 471. I am very sorry personally that Mr. Van Akin has not been able to prepare his paper on the Advantages or Disadvantages of using cable and bringing telephone and telegraph wires into local offices, as I was very much interested in this question myself. However, we will try and get the committee after him next year.

The next committee to report is the Committee on High Tension Wire Crossings, of which Mr. Cellar, of Pennsylvania Lines, Pittsburg, is Chairman.

Mr. Cellar: Mr. President, the Committee on Wire Crossings has a plan to submit. I would like to know whether it is intended to go fully into the plan in this session. If so, I suggest that this committee report be passed until later in the day, because there is considerable elaboration in the scheme and it might take some time.

President: If there are no objections, we will hold this report in abeyance until later on.

The sub-committee on Quarterly Meetings. Mr. Selden is Chairman of the Eastern committee. Have you anything to report otherwise? This is published in the minutes.

Mr. Selden: Nothing, Mr. President, except what appears in the printed minutes of the meeting.

President: Mr. Chenery, Chairman of the Western Committee.

Mr. Chenery: I have nothing to report, Mr. President.

President: I did not expect there would be anything to report, as printed reports have been sent to every member of this meeting.

Are there any special committees to report?

Secretary: Unless you would call constitutional changes reports of special committees.

President: We will take that up as new business.

Now, gentlemen, we get down to election of officers. I would like very much to have that take place now and then I would be a free agent, but in view of the numerous changes in the constitution, which will almost certainly carry, I do not know as I can take it up at the present moment.

Mr. Chenery: I move you, sir, that we dispense with the regular routine of business, as outlined in our present by-laws, and take up the proposed constitution and by-laws, as has been submitted by both the Eastern and Western divisions.

The motion being duly seconded by Mr. Griffith, was carried.

Mr. Chenery: Mr. President, there are a number of members present this morning who were not on hand when this Association was formed. We have with us the first President of the Association of Railway Telegraph Superintendents, and before starting in our regular business, I should be very glad if Mr. W. K. Morley will not only show himself, but possibly address a few remarks to some of us younger boys.

President: I am sure, particularly us younger boys, we will be very glad indeed to hear from Mr. Morley.

Mr. Morley: Well, I hope you will not think I am old; you know I was quite a "kid" when this Association was formed. In my home when we refer to an incident that happened a good while ago by saying, "That happened while we were on earth before." This Association, looking back over it, appears to me that it was formed while I was on earth before, because it seems so long. It was brought home to me in coming over from my home in Grand Rapids more forcibly, when I thought that my boy, who was with me, and who just graduated from college, was not born when this Association was formed in Chicago 28 years ago.

I am very glad to be with you all this morning, and especially want to shake hands with all of you, and more especially the Old Guard that started in in the first place, those of you who are left. I have been in the harness in the transportation business ever since I left the telegraph service, about 25 years ago, all except six months. I was "fired" once; I got one telegram to come home, that I had resigned, otherwise I have been in the official business all that time. I have not done anything to disgrace the Association, and I have always had a warm feeling for the Association, and in all my work I have always looked out for the Telegraph Department, because I knew what they were up against all the time. I never had that feeling that some people have, who are above the Telegraph Department as a sort of necessary evil. You have got to have it, and have got to put up with it.

A year ago I was riding on the Sante Fe Road on the rear end of the observation car with my wife, when she said, "What is the matter with you; what are you doing?" I said, "Why, what is the matter?" She said, "You are

moving your head this way all the time." When I came to myself, I found that I had been looking for broken insulators. I got so in the habit when I was superintendent of the Alton Road that I was always looking for them.

During this time I have graduated many good boys. I find in traveling over the country that they are scattered all over. I met one down in Mexico a while ago. He said: "You used to be on the Alton Road?" I said, "Yes." He said, "I used to work for you in summer." I have more in Canada, and some in Arkansas. I have two in this city—William Cotter: Mr. Cotter tells me I fired him once— and if I had not done so he would probably be a night operator now; Mr. Davison also used to be one of my boys on the Alton Road. I feel quite proud of them all.

When it was suggested to me that I ought to get up and give a talk, I told them I was not much of a talker. They said, "You must get up and we'll have a look at you any way." All big things start very small, which is true of this Association.

I was a superintendent of telegraph in Bloomington, Ill., and there was not another superintendent of telegraph in that town: I was a young fellow. I would go to Chicago and make a trip around among the superintendents of telegraph there every two or three weeks, and talk with them and get pointers from them as to how the business should be taken care of. I found that it took a good deal of my time. Finally an idea dawned upon me, that if I could get these all together in some place in Chicago and get their ideas it would save considerable time. So I wrote to the telegraph superintendents in Chicago and asked them if we could have a meeting at Fred Tubb's office, and we

commenced meeting there once a month. We soon found that it would be convenient for us to get the telegraph superintendents outside of Chicago as well, so we sent out for brother Hammond of St. Louis, and brother Selden, who I believe was of the Wabash at that time. And so we commenced to hold those meetings, and the first thing I knew the thing was clear out of my hands, and I see by the number present that it has kept growing ever since.

I have made repeated efforts to find the time to attend one at least of these conventions, but never was able to find the time. This year, knowing that it was in the State of Michigan, and that I was a native of the state, I just dropped everything and came over in order to meet you all.

I believe that is all I have to say. I am obliged to you, and am very anxious to shake hands with all of you and to become acquainted with what I call the new members, although many of you may be old members.

Mr. Kinsman: I was one of the young fellows who had the pleasure of attending that first meeting, and I move that we tender Mr. Morley a vote of thanks for his attendance and his nice talk.

The motion being duly seconded by Mr. Griffith, was carried.

Mr. Morley: Gentlemen, I forgot to say that I now have charge of the best inter-urban road in the state of Michigan, and if any of you ever come to Grand Rapids I shall be very glad to take you over my road and show it to you. Come in the summer if you can, as we have many summer resorts along the road, and it is a very beautiful road. If Grand Rapids were large enough I should extend the invitation to this Association to hold a convention in

Grand Rapids, but I do not think you would enjoy yourselves so much as you would in a larger town, for it is a small town in comparison with the towns in which you generally meet.

President: Mr. Morley, you heard the motion presented, and I have pleasure in tendering you the thanks of the Association. It is a great pleasure to me personally to shake hands with the first president of the organization. A great growth has taken place in the last five years, and I think very large on account of the telephone coming so largely into operation on railways. I am sure we would be pleased at any future meeting if Mr. Morley and some of the earlier presidents who have gone into other ranks would find it convenient to attend some of our meetings. We can always get some good sound advice from them.

Gentlemen, we will now take up the consideration of the revision of the Constitution and By-Laws. For this purpose I think it would perhaps be best to start by taking the minutes of the proceedings at St. Louis that the Chairman of the Western Committee published, and move the adoption of that clause, and then we will take the objections, if any, raised to it by the Eastern Committee. I think we will save time by doing that, taking it clause by clause.

Secretary: I have a few copies here of the proceedings of the St. Louis Committee, and of the proceedings of the Philadelphia Committee which I will pass around.

Mr. Chenery: Mr. President, the minutes of the St. Louis meeting do not contain the by-laws as rehashed; therefore I suggest that instead of the minutes of the St. Louis meeting, that the copies as revised be distributed.

President: Thank you for mentioning that, I had forgotten it. In regard to the revision of the Constitution and By-Laws, I presume you understand that only the active members have a vote. We would be pleased to have all present here remain with us, but if the associate members and guests so desire, they may retire; at the same time we would like to have them remain.

Mr. Selden: In order to expedite matters by presenting first the article as represented by the Western Association committee, and follow that by the statement of the Eastern committee, their idea, and then let the matter be acted on, item by item, as we go on. There is no struggle at all, or anything of that sort, but we are all trying to get together if we can.

President: That is my idea. Where there are no differences, we will put it to vote at once.

Secretary: I have a copy here of the new constitution as proposed by the Western division, and in red ink I have made the changes that were passed upon by the Eastern committee. As you go from item to item I can read each article as it originally appeared and also the red ink corrections as made by the Eastern committee. I think, Mr. Chairman, it would expedite matters if we take up this item by item, and then let me read the corrections, and then submit to a vote of all if they wish to have it as corrected by the Eastern committee.

Mr. Selden: I withdraw my suggestion.

Chairman: In order to cut out superfluous work and just put it to a vote.

After a full discussion and various changes made, the Constitution, By-Laws and Standing Rules, as printed in

this book, were, on motion of Mr. Ryder, seconded by Mr. Davis, unanimously adopted. A complete record of discussion, motions, etc., is on file in the Secretary's office.

President: We have adopted the new constitution and by-laws, to take effect instantly, with the exception that increase in dues shall not apply the present year, and the next order of business is the report of standing committees. The report of the Committee on High Tension Wire Crossings.

Mr. Cellar: Mr. President and Gentlemen of the Convention:

The report of the Committee on High Tension Wire Crossings will be preceded by an explanation of the crossing proposition in general. Your committee has had a great many plans for stable crossings under consideration, beginning with the basket and web hung underneath the wires and advancing to the short span and strong wire feature that was advocated for so long, but we have now taken up something entirely different in principle. We believe that wire crossings over railroad tracks should not be of short span, but that the poles supporting such spans should set back far enough from the tracks to preclude any accident from derailments or accidents of any character. To that end we purpose making the crossing span and the two adjacent spans, one on each side, of construction such as will render impossible the breaking down of the span from any natural cause, either from ice load or wind pressure or anything else that is to be expected in ordinary experience. The poles supporting these three spans are to be made self-supporting and are to be constructed preferably of steel or reinforced concrete; or, if of wood, with such guying as shall make them fixtures. The wires in the high tension

work are expected to be of a large margin of safety as far as tensile strength is concerned, and they are to be given a mathematically calculated sag, so that the strain on them shall be the minimum under any condition. Under this plan the line strain can never come on the wire in the crossing span, therefore, it has nothing to bear up but its own weight and the weight of the ice, snow or other natural accumulation.

After outlining this plan, it became necessary to prepare an agreement form, and specifications to cover the various types of crossings. After very considerable discussion from time to time it was concluded to make the agreement in a form which should make it applicable to all kinds of crossings; that is, an agreement that in itself will not have to be altered to make up any crossing; the alterations necessary through the differing character of the wire crossings to be shown in the specifications. We have separated these different kinds of crossings into six types, viz.: Two for underground work, and four for overhead work. In establishing the line between low tension crossings and high tension crossings we did not go low enough to include as high tension voltages all currents that would do us no harm. We did not try to get that low. We know that the currents carried on the street car trolley wires will do us lots of damage, but we found it impracticable to carry the trolley wires into this class of agreement; therefore, we made the dividing line at 700 volts in order to escape entanglement with the trolley wires. Trolley wires are usually covered in track crossing agreements, and the local conditions very largely govern the manner of the wire construction pertaining to these crossings. We have two types of underground crossings, one for a voltage under 700

volts, the other for 700 volts or over; four types of overhead crossings, one each for high tension and low tension cable crossings, one each for high tension and low tension wire crossings.

I wish to say that while the name given to our committee is the Committee on High Tension Wire Crossings, we felt that it was the intention to have it within the province of the committee to treat of the low tension wires as well.

We made up the specifications for each type of crossing separate, in order that the agreement might be complete, without any omissions or other changes in it that might tend to confuse. We do not recommend the printing of all the specifications on one blank, and thus make one type of specifications effective by crossing out the others.

I will read the agreement for the benefit of the gentlemen who have not copies. (Reads: Agreement made and entered into this day of by and between, etc.)

The drawing is not complete without the identifying clause, and any agreed upon arrangement can be shown in that drawing and made valid by these identifications.

Exhibit B, location drawing: The drawing is made the same size as the license sheet. The specifications are to be printed on the same size sheet and be attached and made a part of the document.

Before I go any further I want to go back to Section 1, and call attention to the fact that the whole work has to be done to the satisfaction of the Superintendent of Telegraph of the Railway Company. Really, if he has his mind made up as to how he wants the work done, that is all that is necessary to have in the license. The specifications are additional ammunition information for him.

The specifications shown as Exhibit A, attached, are also to be identified, and if we cannot agree with our man whom we want to make the crossing our way, exactly on these specifications, we can agree about the alteration of the specifications, and identify that alteration as well as the original specifications, the aim being to make the agreement form absolutely rigid in itself, and the specifications so flexible that through negotiation they can be made to cover any crossing that may come up for consideration.

There are six types of specifications, but only one is to be used with each agreement. For instance, the Pennsylvania ones are R. E. D. 845 A, which refers to specifications for undergrade crossings for roads carrying 700 volts or over. Shows specifications complete for one type of crossing.

Mr. Rhoads: I would like to ask Mr. Cellar if he has been successful in getting any company to agree to that arrangement, and have it in operation. All voltage exceeding 700 volts we are to carry this under the track, and if it is over company's private grounds or public highway crossings.

Mr. Cellar: I am pretty certain we have some undergrade high tension crossings.

President: I might state, for the information of Mr. Rhoads, that there are cases in Canada where they have underground high tension currents up to 40,000 volts, and sub-marine.

Mr. Rhoads: Is it for you to do that, or is it a question of the railroad company?

President: It is a question of the railroad company, with us.

Mr. Cellar: Answering Mr. Rhoads' question, I will say

that we almost always have difficulty in getting any agreement whatever from anybody, but if you will examine the pictures in the book exhibited you will find that the Pennsylvania Lines have succeeded in getting some stably constructed crossings, and I am free to say that we are getting them every day. Our road specifications requiring a carrier wire for the crossing span were not nearly so easy of realization as those that we are using now, although we are using a modified set of these plans at the present time. We are not having any trouble whatever in securing the proper construction under these plans; sometimes more or less modified, of course, where there is any chance whatever for a favorable argument.

Mr. Rhoads: Are we to understand that these are new crossings where companies are building now, or are you making that arrangement with some of the old companies which you are able to show that they have poor construction?

Mr. Cellar: I have only to say that Rome was not built in a day. I expect to be grayer headed than I am now before I get them all fixed up right.

Mr. Taylor: I would like to ask Mr. Cellar where crossings are in highways, whether his company always secures the signing of that form of contract, or of a form of contract of their own, or if they sometimes have to accept contracts submitted by other companies, telephone or telegraph?

President: I think it would be better if you would make little notes and let Mr. Cellar give his full report, and then take your turn at asking questions, and we would save time in that way, but in the meantime I would ask Mr. Cellar to give you the information.

Mr. Cellar: In the matter of making crossings to suit the railroad company at any public service crossing, highway, street or any place else where the public has just as much right to run its own wheelbarrow over the crossing as the railroad company has to run its cars over it, the procuring of agreements is largely dependent upon the legislative enactments and the powers persuasive and otherwise of the railroad lines to secure measures of safety of the proper nature. To be quite candid, I am free to confess that in the commonwealths traversed by the Pennsylvania Lines West of Pittsburg the laws are not in favor of the railroad company, in any large degree, and the most of our success in securing this construction has been through negotiations. There are places where crossings of private rights of way have made it easy for us, but we find the electric companies that carry extremely high pressure are very willing to meet us half way.

If you cannot secure the use of steel poles or reinforced concrete poles, or other indestructible and non-combustible poles, you can make a compromise in the drawing which is shown as Exhibit B, and specify there in writing, "wooden poles (indicating size) are to be used."

We all felt for a long time that the short span was the right one for crossings. Now, I feel, and I think the committee agrees with me, that a long span is a great deal better than the old short span, and by using a stranded conductor with the proper margin of tensile strength, we can make the spans just as long as we please. I know that in our Michigan territory there is a good deal of this high tension transmission construction. We have some of it crossing our G. R. & I line up above Grand Rapids. The Grand Rapids and Muskegon Power Company has a three-wire line carrying 120,000 volts, and through the country the line is carried on steel towers, with spans of 528 feet, the towers being set ten to the mile. The conductors each consist of 6 No. 9 Brown & Sharpe hard drawn copper wires twisted about a jute centre. I do not understand that they have

any trouble whatever with their long spans on these country lines.

The whole proposition is worked out on a definite mathematical basis, and on the Lines West of Pittsburgh as a working proposition we have in addition a set of tables made up that show in feet and inches the exact sag requisite in any span; that is, the deflection below the horizontal, of any wire of any given size in any given span. We do not have to stop and work out each problem as it comes up, because we have these tables to go by.

Low tension wires have specifications that are a good deal in evidence by their absence. I find that it is much easier to secure a suitably constructed crossing of wires carrying high pressure currents than it is to secure a suitably constructed crossing of low tension lines and of telephone wires especially; therefore, we have mentioned the low tension wire specification very delicately. We specified the minimum size of line wire, for instance, to be—if of hard drawn copper, not less than No. 9 Brown and Sharpe gauge. We have had considerable discussion in our committee about making the standard of copper exclusively and concluded that under the existing laws, and especially in rural territory where the railroad traffic is light, that iron wire is a pretty good thing anyhow.

We have given these specifications considerable study, and submit them to the Association with recommendation that united measures be taken for their adoption and use throughout the country, realizing that measures for such adoption must be progressive, and feeling that any little start that any of the gentlemen of the convention can make in their use will realize good ends by our united action.

Respectfully submitted,

G. A. CELLAR,

G. H. GROCE,

C. SELDEN,

Committee on High Tension Wire Crossings.

I move the adoption of the report of the Committee on Wire Crossings.

President: Gentlemen: We have heard this interesting and full report of the Committee on Wire Crossings. I think you will all agree with me that it is one of the most important reports we have had brought before this Association for a number of years.

(The above motion, being duly seconded, was carried.)

President: This report of the Committee is open for discussion. I trust that the gentlemen who have been listening to Mr. Cellar have made their notes and will condense their remarks as much as possible consistent with drawing out the information we require.

Mr. Cellar: May I say a word before the discussion is begun. I have here a book containing newspaper clippings reporting accidents from high tension wires coming down and kindred troubles, and I want to pass it around among the gentlemen and let them look at it. It consists of clippings received between September 11th and December 31, 1907, and from November 13, 1908 to June 21, 1909. The book is full of them.

Mr. Davis: Mr. Chairman: I think we are certainly indebted to that Committee for the very concise and plain manner in which that report has been submitted. As you have already said, I think it is one of the most important things before this convention, and I hope we will not have to hurry away from it.

Now we have, from time to time, I guess all of us had the same experience, that when we tried to get somebody to sign up an agreement they will say that the other roads do not exact the same sort of specifications that we are trying to exact. In several different cases I have been up against

it in this way. I adopted the Pennsylvania Standard, and when we go to a traction line company and ask them to install their wires or make their construction in accordance with these specifications, they would say it is unreasonable, unjust, unnecessary. We would say, we have the same specifications that are used by the Pennsylvania Company. The Company would come back at us and say, in some cases, we are crossing the Pennsylvania Railroad in several places and they do not ask us to do anything of that kind.

Now in order to make this effective and get the best results out of the work that this Committee has done upon it, I believe that the Committee should be retained, so that from time to time we may ask that Committee for whatever points that will turn up and that are not clear to us. I would suggest also that all of the railroads and every man represented here, or every railroad represented here, should try to come just as close as possible to what that Committee has recommended, so that when we say to a man, we want you to put up that sort of construction, we can say, all the other railroads are doing the same thing and we are not asking anything unreasonable. Furthermore, if all the railroads get together on any one thing it would be a very easy matter, probably, to get our legal departments to help us along with a little legislation, to make it compulsory in the different states, stating that it is for the protection of lives of trainmen, and also of our linemen, if you please. I, therefore, move, if it has not already been covered by the resolution that has been passed, that this resolution be passed. "It is the unanimous opinion of the members of the Association of Railway Telegraph Superintendents assembled here, that the report of the Committee on wire crossings should be accepted and that the railroads should, so far as practicable, adopt the plans recommended by our committee."

Mr. Lathrop: I second the motion. (Carried).

President: Have any of you any remarks to make or any questions to ask of this Committee?

Mr. Dyer. I make a motion that the Committee be continued and the Association informed of any matter of interest to the members. (Seconded by Mr. Davis).

President: It has been moved and seconded that the present Committee be continued in order to furnish any information desired to the various members of this Association.

I might say before putting the question that the Committee consists of Mr. Cellar, Chairman, Mr. Groce, Mr. Daley, Mr. Selden, and our late member Mr. Millington. Mr. Millington and Mr. Dailey will have to be replaced.

Mr. Cellar: May I suggest that, the foundation having been pretty well completed, that there is another phase of the subject that ought to be considered before the Committee formation is entirely decided upon, and that is that in some of the commonwealths there is an adequate law to cover safe construction, and while I do not anticipate that the railroad companies will want to make any aggressive campaign in the direction of securing enactments more favorable to safety in wire construction at the present time, I do think we should have that further end in mind, and it seems to me that we perhaps ought to have a little more membership in the Committee.

In preparing the specification for low tension wires we have aimed to secure some reasonable stability without infringing on Western Union specifications. I do not think there is anything in them that the Western Union can have any objection to on account of onerous requirements.

President: The motion is by Mr. Dyer, seconded by Mr. Davis, that the present Committee on High Tension Wire

Crossings be continued and additional names be added by the incoming president. (Carried).

Mr. Griffith. Mr. President: The telegraph companies are equally interested with the railroads, as a matter of their own protection in having the most substantial and safe crossings that it is possible to give. We all know that we are required to give a certain clearance over our rails for wires, and it has been my experience, and I guess yours too, that we can get that required clearance from the telegraph companies much easier than we can from any other concern. They more readily understand the necessity for it, and I have yet to know of one case that I have brought up in my own territory where their wires were not built to required height that they did not cheerfully comply with it and were always ready to make it safe and substantial in every way, and I believe you will find that they will give you any aid that they can in this Committee that you are about to appoint.

Their wires are protected the same as the railroad wires, because they have a great many more wires than the railroad, and of course their troubles must be greater. They look at it from the interruption standpoint, while railroaders look at it as a matter of safety in addition to the interruption of our lines, and no corporation can overlook that fundamental rule. I believe Mr. Bristol or any construction man will cheerfully co-operate with the Committee.

President: I might say, gentlemen, that this report is particularly interesting to me at this time. As I have stated in previous meetings of this Association, we have been able to get along pretty well regarding wire crossings on account of the Canadian Railway Commission. They provided specifications which were finally adopted, after full discussion by telephone companies and railroad companies.

After a great deal of consideration and changing the

plans a number of times, we finally decided on a form of specification regarding high tension crossings, after we had had a meeting in Montreal in the rooms of the Canadian Society of Engineers, with the various power companies in that part of the country, and finally we arrived at something which was acceptable to all, and recently the railway commission have decided to issue specifications for this branch of work, in fact, taking up wire crossings. They submitted to the various railway companies a draught of the proposed rules, but unfortunately in our company, and I presume the same with the Grand Trunk and Michigan Central and others, the railway department did not refer to the telegraph department until the last moment. The date was set about a week ago at which the railway commission proposed issuing the orders, but most fortunately we learned of it in the telegraph department and managed to have our legal department obtain a delay in the final order, and requested that a meeting be arranged with the Electrical Engineer of the commission and the various corporations or companies interested. The railway commission thought that it was a very good idea and referred to their electrical engineer, Mr. Murphy, with a request that the whole matter be settled as soon as possible because they wanted to get it off their list. I wrote Mr. Murphy asking him to arrange a date for the meeting and received reply from him that he could not give a date immediately. I expected it would be this week, when various members of our company and the Grand Trunk and Michigan Central would naturally desire to be at the annual meeting of the Association. Action has not yet, therefore, been taken, and I am very much pleased to obtain this report, which I hope will be in time to submit to the consideration of the railway commission.

I might say that recently, in the past two or three

weeks, they passed an order for a wire crossing of 40,000 volts and upwards specifications, simply of one single wooden pole on each side of the road, to be properly guyed at right angles to the track. They did specify that the conductor should be stranded copper of 25 per cent. greater tensile strength, 25 per cent. greater conductivity, for the span crossing the road, and for the next span on each side, and also I think provided for double cross-arms, but the pole structure is decidedly weak. A runaway team on a country road may knock down that wire and have the high tension wire on the track, and if it went on the track and on our wires, the Lord only knows how much trouble it will cause hundreds of miles away. No protection was made of the pole from fire, and I have suggested to our legal department that they appeal against the decision of the railway commission. I presume a good many of you have been up against pretty much the same thing.

Mr. Selden: I move to take a recess until six o'clock this evening. (Seconded by Mr. Drew.) (Carried.)

THIRD SESSION.

The meeting was called to order by the President, Mr. Camp, at 8:10 P. M., Wednesday evening, June 23d.

President: We are under the head of New Business—including papers and their discussion.

Secretary: We have these soft paper copies of the five papers that were received in time to be published, if anybody wants them. (Secretary passed around copies.)

President: Mr. Davis, you are Chairman of the Topic Committee; have you arranged for any particular order in which to bring forward the papers to be read?

Mr. Davis: I thought, Mr. Chairman, that the order in which they appear there was the proper order for the read-

ing of them, but Mr. Jennings is not here, and I would therefore suggest that we have the papers in the order they come, skipping the men who are not present, and then when they do come in let them read the papers.

Mr. Chenery: Before I listened long enough to hear Mr. Davis' talk the thought occurred to me that as Mr. Millington was to prepare a paper on Office Organization, and that paper has been assigned to Mr. Sheldon, and Mr. Sheldon is here with the paper, it might be well to let him read it.

President: We will now have Mr. Sheldon's paper on Efficient Office Organization.

EFFICIENCY OF OFFICE ORGANIZATION.

By J. B. Sheldon.

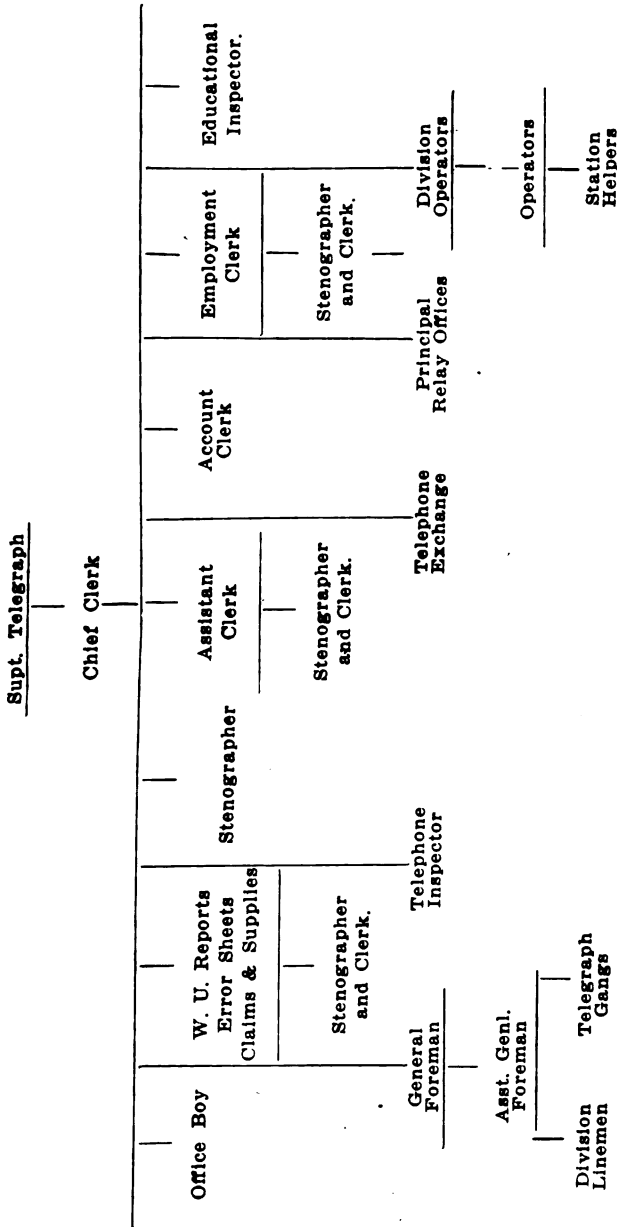
Superintendent of Telegraph of the Union Pacific Railway,
Omaha.

There are a number of essential qualifications to consider in connection with the subject; four of the more important ones, which I will name, are, discipline, harmony, co-operation and zeal. This combination of principles, if adhered to, will certainly result in efficiency. The first to inculcate is discipline, which calls for punctuality and respect for co-laborers. An employe who is ever tardy, without good reasons, generally detracts the attention of the other employes from their work, causes unnecessary comment, ill feeling is engendered and the necessary respect is lost sight of. Harmony must prevail if proper discipline is maintained, and, without harmony, organization would be a lost cause; therefore, harmony and co-operation must be considered in unison for efficiency. Of course, every employe has his or her work mapped out in detail, in other words, specialized. However, there are times when it is really necessary to co-operate

and combine certain work to expedite it, or to help one another in case of absence, because of sickness or other cause, and this is where co-operation speaks for itself as an important adjunct. Zeal is the active power of efficient organization produced by discipline, harmony and co-operation. Work must be entered into with a certain amount of enthusiasm or desired results cannot be accomplished. The head of an organization must be impartial, fair-minded and pleasant. Subordinates will then look up to him as a leader and, in nearly all cases, follow in his footsteps. However, if they are not inclined in this way, and are unobserving of the example, they will have no excuse when found wanting. A grouch is a disorganizer and should be dealt with accordingly.

In handling the subject of "Efficiency of Office Organization," I am confining my remarks entirely to the office of the Superintendent of Telegraph, which I assume will be acceptable to all concerned.

A proper and satisfactory organization of a telegraph department, owing to diversity and peculiarity of the work, is somewhat difficult to arrange, and because of difference in size of roads and character and volume of work available and assigned, no general plan of organization would do for all. Our plan is as shown in the diagram given herewith:



The Superintendent of Telegraph, in order to exercise a proper supervision of his department, to have opportunity to look personally after many matters requiring attention along the line, to have time to meet and talk with callers who have ideas of interest and benefit to discuss, and to be able to keep posted on progress in our field of work, plan improvements, attend meetings of our associations regularly, etc., must not be tied down to close details of office work, and office organization should be planned to afford him such opportunities. Otherwise, by tying him down closely to a desk, with barely time to wade through a mass of detail work, many larger things of importance and much value would be neglected through sheer lack of opportunity to give them the attention required. With the great progress that has been made in the railroad business within recent years, the necessity of more supervision in many departments has manifested itself, partly because everything has become more intricate and is thus more difficult to oversee, and also because of the rule of "whatever is worth doing at all is worth doing well," is a real factor and will not permit skimming on the surface or sluffing in any way. Perhaps the words "and promptly" should be added to this rule, because now-a-days, with the rush of things, promptness is more of a necessity than ever before. Our departments have perhaps been more backward in this matter of supervision than any of the others, but we must eventually move on with the trend of progress in this respect, in order that what we do and have to look after may be of a high order of efficiency and compare favorably with the efforts of others.

The Chief Clerk must keep in close touch with the detail of it all and have everything at his finger-ends. On a large road, he is a very busy man, it devolving upon him, besides taking care of the more important correspondence and lay-

ing out the details of things, to see that everything is carried out as planned and that the force all understand and do their work properly and promptly. He also must have opportunity for supervision, for the planning of, and helping on, the work of others, and should not be so closely tied down with matters others can handle, that he will not have time to see that the work of all is harmonious, kept close up-to-date, and efficient. His time and work are necessarily constantly broken into in answering the inquiries and attending to the needs of others, and this he must always be ready and willing to do, even to the detriment at times of his own special work, in order that it may be handled with the least delay and best results. Convenient filing and record arrangements can assist greatly and save much valuable time. We have a system of envelopes, to hold letter size sheets, that are used for the filing of matter under special subjects of importance, to which frequent reference is necessary, that are of much worth. For instance, a separate envelope is kept for telephone matters at each place, and filed in alphabetical order, in which all the correspondence in regard thereto, including carbon copies of our own letters, is kept.

Then we have an envelope for each of many special subjects of interest, that are numbered and indexed, so everything we have had in regard thereto can be turned to at a moment's notice. Another set of separately indexed envelopes is kept for estimates and work upon the lines, which contain all the correspondence pertaining thereto. Filing cases, one for each letter of the alphabet, are also maintained for wire crossing correspondence, which is quite voluminous, so that we can readily locate everything pertaining to any particular crossing. The stenographer of the Chief Clerk keeps up these files, as well as a general correspondence record book, gets out the files as needed and re-

turns them when through with. Besides these special and permanent files, regular filing cases are maintained for ordinary correspondence to which frequent reference is not necessary. These are some of the special arrangements that can be made to assist the work.

On large roads, the Chief Clerk should have a good general assistant to help look after the accounts, and some of the other details, handle some of the less important general correspondence, and be available for more or less special work that constantly confronts us. Such a clerk can answer many of the telephone calls and look after a great variety of detail, thus saving the Chief Clerk from much interruption and giving him better opportunity to look after more important matters. Such a clerk can also fill in other position in cases of temporary vacancy, sickness, etc.

An account clerk is also essential on roads where the telegraph department has many pay rolls, bills, vouchers, and invoices to handle, and material and supplies to care for, as all of these things represent money value and must have prompt and proper attention.

The Western Union Telegraph Company's business is also sufficient and important enough on large roads to require a good clerk to take charge of it, including the auditing of the reports, adjustment of error sheets, investigation of complaints and claims, the furnishing of supplies, etc., and he should have a stenographer and clerk to assist him in this work, in order to perform it promptly and efficiently.

The employment of help, taking in operators, station-helpers and linemen, with the investigations and examinations that are necessary, including the looking up and passing upon previous records, and educational, switch-board and physical examinations, requires much time and attention of a competent man on a road like ours, where an aver-

age of about 100 operators, station-helpers and linemen are employed per month. The exercise of much care is necessary to secure reliable and satisfactory help and in assigning it where it will give the best results and be satisfied to stay a reasonable length of time. With this position should also go the keeping of the records of all the employes of the department, with the help of a stenographer, and clerk to assist in the work in general. We have in use the "Macey" card system for these records, which has been found very convenient and much of a time-saver. These cards, which are five inches by eight inches in size, are ruled on one side for the record of employment at different capacities, as follows:

(Name)					No.	
Transfers.	Date.	Capacity.	Transfers	Date.	Capacity.	Remarks.

Then the reverse side is ruled for record of demerits, seniority standings by division and remarks.

Another form is used for records of employees at stations.

Separate card files are kept for employes in the service and for former employes. In starting this system, we assigned a card to every employe and former employe of whom we had record, but did not undertake to transfer the records of previous changes to the new cards; instead, each card is numbered and all the papers bearing on an employe or former employe, including record of employment previous to the starting of the present system, are filed under this number, so they are handy for ready reference whenever needed. Operators, station-helpers (who are all telegraph students) and linemen are all employed through the office of the Superintendent of Telegraph, which enables us to bring good men from different parts of the country for positions, with a certainty that, if there should be no

opening immediately upon arrival, we will be able to place them at least very soon. This cannot be done so well, or emergencies met so promptly, where the help is employed locally on divisions, as the needs on any one division would not be sufficient to warrant sending for and keeping so many men available as where the whole road is supplied from one source.

Closely connected with the employment bureau is the Educational Inspector, who looks out specially for the student-helpers at stations, of whom we have about two hundred, and the students in various schools that we are encouraging, to see that satisfactory progress is made and that promotions are forthcoming as they are deserved. Until recently, but little attention has been paid to the selection or education of those seeking to become operators and agents, most anybody strong enough to handle freight, baggage and express having been assigned to helpers positions, the stepping-stone to operators positions, without regard to their qualifications for advancement or desire to advance. Then, when once employed, they were left to themselves to learn as much, and how, as they saw fit, with no one specially interested to encourage and show them, to see that they had proper opportunities for study and practice and availed themselves fully of them. Now, helpers are selected from those who earnestly wish to become operators, being taken generally from telegraph schools where some progress has been made, both in telegraphy and station work and accounts, and before employment is given them, their fitness in general, in respect to education, physical condition, etc., is passed upon and decided. Then, when given positions, their future progress is closely watched, reports in regard to each one being made monthly and carefully checked up. If they do not progress as they should, special investigation is made as to the cause and effort is made to

right whatever is wrong. They are advanced in pay now and then as their progress warrants and to operators' positions when they are qualified therefor, many of them being thus promoted each month. Promotions are bulletined to all other helpers on the divisions, which shows them that they are not overlooked and gives them encouragement. They must qualify in station work as well as in telegraphy, and thus, while the average former operator did not aspire to much beyond telegraphy the coming operator will be equipped for agents' positions as vacancies occur and thus afford relief for the dearth that has existed in suitable men for this line of railroad work. The looking out for all of these students and keeping in close touch with them, and the frequent inspection of the schools and offering of suggestions and help to them in their work and instruction, for our future benefit, keeps the inspector very busy. We feel that this is a good paying investment, for, besides making for us a better class of help, it assists very much in relieving the shortage that frequently exists.

Division operators, who in all cases are the chief dispatchers, call on the superintendent of telegraph for all new operators and helpers required, and, although transfers and changes are made locally as conditions necessitate, these changes are reported to the superintendent of telegraph on regular form at the end of each month, from which the card records are kept up. The superintendent of telegraph is consulted, however, in regard to changes in the more important matters connected with the service as conditions arise in important offices, especially in managers, as well as about that which is different from the ordinary and regular run of things. Their authority is limited, in fact, practically to the existing order of things, as wire, circuit and instrument changes, the connection of new offices and disconnection of former ones, direction of work of division and special line-

men (outside of ordinary trouble repairs), etc., are directed by the superintendent of telegraph.

The five principal telegraph offices, located at Omaha, Cheyenne, Ogden, Kansas City and Denver, all of which are division headquarters, are directly under the superintendent of telegraph, carried on his pay rolls and all changes in force are made directly through his office. The managers of these offices do the testing of wires, in their respective territories, give instructions to linemen in regard to repairs of trouble and are responsible for the working condition of the circuits under their jurisdiction.

Private branch telephone exchanges and all telephone matters are directly under the superintendent of telegraph, no additions, removals or changes being made in this service anywhere along the road except upon his order. Complete records are kept of all this service, including rental and purchase expense and toll-line charges.

To the general foreman is assigned the duty of inspection of the lines and offices, the recommending of work required to keep the plant in good condition and the making of estimates therefor, the giving of instructions to foremen and line repairers in regard to their work, and exercise of general supervision of such work to see that it is economically and properly done. In this work he requires an experienced assistant to look personally after much of the work that is being done, to take charge of smaller jobs that do not require a special foreman and to stay with the gangs much of the time and plan with the foremen for the performance of the work to the best advantage.

The telephone inspector is charged with the inspection and repair of the telephone equipment and is responsible for its condition and satisfactory working order. With the great development that has taken place in railroad telephone service within recent years, and the dependence

placed upon it in important operations, it is very essential that we should not overlook the necessity of supplying such force, as well as other facilities, as required, to maintain the apparatus in a high order of efficiency. Frequent and thorough inspection by an expert in this line of work is necessary for the accomplishment of this result and he should be promptly supplied with what he requires for such repairs and improvements as are needed. He can also install new apparatus, including telephone train-despatching equipment. Division linemen should, of course, assist in the telephone work, by installing some of the more ordinary equipment, make such repairs and changes as they can handle and renew batteries. The general foreman and assistant general foreman should be well posted in telephone work and assist in the direction as occasion remands.

In conclusion, I would say that the success of any organization or system depends largely upon the degree of excellence in which it is maintained. It is comparatively easy to adopt new and improved methods, but much diligent effort is required to conform to the standard as intended at inception. If we wish to succeed, therefore, in whatever organization we may adopt, we must devote to it the time and energy that are necessary to keep it up.

President: I might say, gentlemen, that we expected Mr. Frobes to carry on the discussion on this, but he is not present. Mr. Selden will discuss it.

Mr. Selden: When a man shows up on a division quite a distance from you, Mr. Sheldon, for a position, how do you arrange in this case, or do they all have to come to your headquarters?

Mr. Sheldon: When they show up at a distance they generally apply to a chief despatcher, and he wires to my office to see if he is in good standing and is all right; they cannot hire him until he hears from me.

Mr. Selden: You get your cards once a month from his employment, blanks?

Mr. Sheldon: Yes.

Mr. Selden: That differs from our system. When he applies for a position he sends a card in to the office, as well as inquiring as to his record. Very frequently we have no record, but he makes out a card for the man the very moment he concludes he is going to hire him, whether extra or otherwise. Then if that man is taken into regular employment, as he moves from station to station another card comes in, so that we keep in constant touch with him, we might say, for only two or three days apart. We do not wait until the end of the month before getting a card, or make it up in our office. It is simply up to the division people.

Mr. Sheldon: We do not hire any operators unless they are submitted to the superintendent's office to see if they are in good standing or not. We generally have a record from that. If we do not have anything from them at the time, we wire them and they take his record and send it in. In the meantime we inquire on the regular blanks.

Mr. Dyer: In Salt Lake we handle the matter just about as has been placed before you. We have a cipher to use for distant points. The Chief Operator will give the name of the man and ask if he may be employed, and we reply, if we have a record we O. K. the hiring of that man; if there is any doubt about it we send him a cipher message and hire him subject to approval; then we investigate, and if it is all right we handle the rest by correspondence.

Mr. Chenery: On the Missouri Pacific we handle the application about the same as has been outlined by Mr. Sheldon and Mr. Dyer. In addition to that, however, we keep a card of every position on the road in the telegraph

service, essentially every man occupying that position. We get our record from the division operators every month of the changes made, so that I can tell at any time what man is in the position of night operator or agent and telegrapher at any particular station. We find that useful at times when we want to know who was on duty a certain night two or three months back, and we of course keep a double record in that way.

Mr. Sheldon: Mr. Chenery refers to our Macey system. The name is at the top of the card, and the number is put on there, date, capacity and transfers. They have first, second and third trick operators. Remarks are on the reverse side of the card—remarks, date, we have everything in detail; and the other card is another form used for recording the employees of stations, names of station agents, first, second and third trick operator, etc. We keep a complete record from the time he enters the service and of the positions and dates. We get that report once a month.

Mr. Dyer: We get that report immediately, a transfer is made.

Mr. Davis: I had the pleasure of visiting Mr. Sheldon out in Omaha not a great while ago, and I want to say that everything he said in that paper he has in effect, and if any of you happen to be out that way and have time to see him, I am sure you will enjoy it. His system is complete and effective. His records are such that he can tell you just exactly where the men are, back almost indefinitely, and in addition he has the names of the men alphabetically. In addition to that, he has everything else connected with his office just as complete and concise as this. He has prepared that paper at the request of the Topics Committee on rather short notice, but when I saw what he had out there, I thought it would be very interesting to all of us, and he has been kind enough to make a complete report of it, and I am

sure when it is printed in our proceedings it will be a novel thing to have in our files.

Mr. Fisher: I admired the easy way in which the Chairman of the Topic Committee says, "If you gentlemen happen out in Omaha, call in and see him," just as if it was across the street. I will also take an exception to the Chairman of the Topic Committee apologizing for that paper; it is good enough not to need apologies.

I would like to ask a little information. You said something in your paper about telegraph schools. Will you, as a matter of information, say how you conduct those schools, how many have you, and if you find it useful. We have a school in Bedford, Pa., that turns out a good many pretty good boys, but find it more useful from a moral than from a physical effect. I wondered if your experience might have been something the same as ours.

Mr. Sheldon: Prior to 1908, we had about 15 students on the Union Pacific System. After March, 1908, when the new law went into effect, since then we have increased to about 200. We have several commercial colleges on the Union Pacific System; there are two at Omaha, one at Kansas City, one at Salina, Kansas, one at Denver, and I believe one at Grand Island,—I believe in all, six, on the system.

Mr. Fisher: Are these schools conducted by the Union Pacific Railroad?

Mr. Sheldon: No, sir, they are commercial business colleges. We have run our despatcher's wire into the college. We have an educational inspector who visits those colleges; we give them forms of all kinds, billing, etc., the regular student forms that we have, and they are educated in that line. Our inspector goes up there once every week or ten days.

Mr. Fisher: Do you finance the school?

Mr. Sheldon: No, we have nothing to do with it at all; we simply furnish them the forms and give them what help we can and give them our despatcher's wire. It is connected up in such a condition that they cannot break in on it, but they can listen. We have our inspector who goes in there every week or ten days and inspects them to see how they are getting along and gives them a little information in regard to the forms.

Mr. Chenery: May I ask what this educational inspector is; what are his duties?

Mr. Sheldon: He is one of our old agents, a telegrapher himself, a well posted man; in our telegraph department we simply named him that. His name is Seaver, and they call his students the Seaverites. He is well posted in telegraphy and a very gentlemanly fellow, and he goes in and helps the boys out, and places them on the system whenever there is a vacancy occurs. The Division Superintendents all come into my office for the students, and we send them out to them, and they look after them, and he visits them at those stations and checks them in and sees that they are all right, and goes around occasionally and sees how they are advancing, and picks out a man that is advancing well and promotes them to operators right along.

Mr. Rhoads: We have with us to-night Mr. Dodge, of the Valparaiso Business College, a member of this Association. I think a word from Mr. Dodge might be interesting to tell what they are doing along that line now and how he is teaching business in the telegraphers' work.

Mr. Dodge: I do not know what I might add, any further than we have a school at Valparaiso and have run it for several years, seating 500 students a year, a school of telegraphy, and in connection with telegraphic work we give penmanship drill and typewriting. We make an effort to

train our people on the standard rules, but have not got into agency work as yet. We are thinking of doing that this fall. I am of the opinion that we have the largest attendance of any school, and of course if we went into this other work it would enhance the value of the course we give. We of course cover the rudiments, the rules, switchboards and we have a railroad train despatcher's wire in the school and all the advanced students are permitted to copy from that, although they are not receiving instructions. I presume if I said anything more it would be in the nature of an advertisement, so I will close.

President: We will now hear from Mr. Folsom.

Mr. Folsom: I want to say prefatory to this paper that the spirit of this age is to specialize. The physician studies the subject thoroughly and then becomes an oculist, or an aurist, or a neurologist, or specializes in some other particular line. We have endeavored to specialize on the subject of the preservation of the pole and the post, recognizing that the conditions surrounding telegraph poles were very different from those of any other structural timber, more difficult in some respects to treat, and less difficulty in others.

THE PRESERVATION OF POLES.

By H. P. Folson.

Before entering upon our subject proper, we deem it advisable to make a few remarks on the subject of poles and the former theories of their preservation.

There are about 40,000,000 poles in use in the United States, by telegraph, telephone and other companies, valued at \$5.00 to \$7.00 each, on an average, or a total of \$200,000,000 to \$280,000,000. It requires about 3,800,000 poles each year to replace those that have become useless

from decay. The average life of white cedar and chestnut poles in the United States, other than the Gulf States, is about twelve years. Hence, the depreciation is about eight and one-half per cent. per year or \$17,000,000.

The subject of the preservation of timber has engaged the attention of scientists and engineers for over a hundred years.

In 1884, Mr. Boulton, an eminent engineer of England, read a paper before the Royal Society of Engineers, in which he reviewed all the known methods of treating timber antiseptically. He had an experience of over thirty years in treating poles. He showed that the brush treatment, the open and closed tank treatment, the vacuum and pressure processes with and without heat, were then in use; that creosote, sulphate of copper, zinc chloride, corrosive sublimate, and twenty-five or thirty other well known germicides, were in use or had been tried at that time; over a hundred patents had been taken out on wood preservers, and different methods of injecting chemicals into timber. Indeed all the different chemicals now in use to preserve poles, were well known then. This paper of Mr. Boulton, was discussed by practical engineers from many countries, and it, together with the discussions were printed in book form. It constitutes today a classic on the antiseptic treatment of timber. Yet, at that time the real cause of the decay of timber was not known, to more than a dozen in the convention. Indeed, fungi, as a cause of the decay, was scouted by some of the greatest scientists in the world at that time. Yet, strange as it may seem, everyone of the chemicals that had been used, were most powerful germicides and are today in constant use for that purpose.

It is a well established fact that the cause of the decay of poles at the ground line, is a fungus growth. In other words a germ, which feeds upon nourishment taken from the

timber. Furthermore, it is known, that this germ attacks the pole from the outside and not the inside (except of course in cases of butt rot).

Although these various methods of impregnating timber with chemicals, have been known and used with some variations, for sixty years, it is estimated, that less than ten per cent. of the poles in use in the United States have been treated by any method.

This doubtless comes, First: from the plentifulness and cheapness of poles.

Second: From the fact that most methods require large and expensive plants and therefore require the poles to be transported to the plant for treatment, thence to the point where they are used.

Third: Because of the difficulty of obtaining positive and uniformly good results.

Mr. Boulton in his paper and the discussions thereof, established, that the materials used to preserve poles by the method then used, must have two properties.

A. It must be a germicide, and

B. It must be a germ excluder. That is, it must be of and in itself a germicide and a germ excluder.

The great effort of all experimenters and scientists from that day to this, has been to get some chemicals, or combination of chemicals, than when injected in a soluble condition, would become immediately insoluble. That would not wash, leach or soak out, but would remain in the timber indefinitely and kill the germs therein, and prevent other germs from entering. **Science has so far failed to find this substance.** It is a very easy thing to obtain powerful germicides. Indeed there are many such—sulphate of copper, chloride of zinc, creosote, chloride of sodium, sulphate iron

and many others, are all powerful and efficient germicides and cheap enough too, to be used in the preservation of poles. So powerful is sulphate of copper, that one drop of a saturated solution thereof placed in a fish aquarium holding four gallons of water, will destroy all the algae therein, yet, leave the fish uninjured; or if you place one-half ounce of sulphate of copper in a cistern, containing sixty or seventy barrels of water, it will kill all the algae therein, and render the water almost pure. Chloride of sodium or common salt is one of the most universal and widely used preservatives of both animal and vegetable matter known. Canal boat builders have for years been in the habit of placing a false bottom or box between the ribs of their boats, and filling this with salt. As the boat sank in the water from its weight, the timbers become soaked, and the salt is taken up by capillary attraction and the osmotic forces. Many barrels of salt were yearly thrown into the bilge. We are told that all owners of wooden vessels sailing the Great Lakes, use large quantities of salt every year in preserving their vessels. From ten to fifty barrels being used sometimes, according to size of the boat. Common observation teaches us that salt barrels, fish kegs, wooden salt evaporation tanks, do not decay. Salt brine from the ice cream freezer thrown on the grass, poisons the plant food and it dies. So with the wood destroying fungus in a pole, the salt and sulphate of copper poison its food, it dies and the decay ceases.

It is a popular notion that deep penetration of germicides is necessary to effectively preserve timber or poles. This we have found by common observation and many experiments with the microscope is not true. The wood destroying germs begin their ravages on the outside and work towards the center of the pole. It follows then, that if the germs on and near the surface of the pole at the ground line, can be destroyed, and the myriads of germs in the air and in the

soil, surrounding the pole, can be excluded, the pole will be preserved. The only advantage there is in deep penetration when using the old methods, is, it requires a longer time for the germicides to be leached or washed out. Mr. Boulton in his admirable work, above referred to, says: "That the quicker germicides will soak into the pole, the quicker they will volatilize and leach or wash out."

NEW METHOD.

We believe the practical requirements of any successful method of preserving poles must have the following advantages:

1. It must be a method that can be used by large or small companies, having a large or small number of poles to treat.
2. It must be capable of being applied to new, or partially decayed poles in the ground.
3. It must not require a large or expensive plant.
4. It must not require highly skilled labor.
5. It must not require the transportation of poles to and from the plant.
6. It must not require more than one treatment, and must be positive and effective, and relatively inexpensive.

When we began experimenting over nine years ago, with our present method, the following facts had been established by scientists and experimenters. That poles commence to decay at, or about the ground line; that the cause of this decay is a fungus growth, or living germ; that when this germ is killed, the decay ceases; that many chemicals will kill wood destroying germs. It was also known that germicides in solution, held in contact with wood, will be taken up into the pores of the wood by capillary attraction and the osmotic forces.

Recognizing the above facts and conditions, we began experimenting with our present method. Our aim was, not to secure a chemical that was both a germicide and a germ excluder, in and of itself, but to use one or more of the well known germicides and endeavor to exclude the germs in the air and soil, mechanically. To devise a method which would accomplish these results, we found to be a very difficult problem. As most germicides which are cheap enough and powerful enough to be used in preserving poles are soluble, the mechanical devise must serve three purposes.

It must exclude the germ after the pole is treated and at the same time must retain and protect the chemicals in constant contact with the pole at the ground line; it must also prevent the chemicals from being taken up and absorbed by the surrounding soil.

MODE OF PROCEDURE.

We first dig down around the pole a distance of about fourteen inches from the ground line, and clean off any decayed wood from the surface of the pole (if it is an old pole). We then place a layer of Portland cement mixed with sand, around the pole at the bottom of the excavation. Next, place around the pole our hydrobestos jacket one to two inches therefrom, imbedding the lower edge of the same in the cement. The two edges of the jacket are lapped from one to two inches and fastened with a specially prepared cement and tacked upon a lath inside the jacket. We next fill the space between the pole and the jacket with our germicides in a dry state, mixed with sand. We then form around the top of the jacket a re-enforced cap or collar made of Portland cement (one part to three and one-half of sand). For re-enforcing, we use one or more wires around the pole, imbedded in said cement. (Old telegraph or telephone wire may be used). The collar pro-

protects the chemicals and jacket from the action of the rain and snow, and if along steam railroads, protects the pole against the numerous grass fires. The chemicals are slowly dissolved by the natural moisture in the pole, and they pass into the same by capillary attraction. As they cannot pass out into the surrounding ground, they go into the pole, thus destroying all fungi and wood destroying insects. **We have then, a continuous absorption of chemicals and a mechanical exclusion of germs.** The hydrobestos jacket is a pure mineral, composed of specially prepared and purified asbestos and asphaltum. This material is subjected to a pressure of about 27,000 pounds per square inch, in its manufacture and is a very important factor in our method. There is no animal or vegetable fibre in it and it is practically indestructible in the situation used.

We have used all kinds of metals and materials, but hydrobestos seems to give the best results. In some special locations we form the jacket of cement. The re-enforced Portland cement cap, is an important part of the protective device. It prevents the rain and snow from entering the receptacle, holding the germicides, and gives a stability and attractiveness to the pole.

This collar does not crack owing to the fact that there is practically no expansion and contraction of the pole at the ground line, besides it prevents grass fired along steam railroads from setting fire to the pole.

Let it be remembered that there is no secret about germicides among scientists. Our aim was to select those that were powerful and effective; that would not injure or weaken the fibre of the wood and yet, were cheap enough to be practicable.

We use Hydrated Lime (Rock), Chloride of Sodium, mixed with coarse sand and one-quarter to one pound sul-

phate of copper (per pole) according to size, and condition of the pole. Indeed we vary the above proportions some what in case of partially decayed poles according to condition.

We are frequently asked as to the effect of our treatment on unseasoned poles and posts. While we do not approve of the practice of putting poles and posts in the ground while green or unseasoned for many reasons, yet we have treated Sycamore, Willow, Soft Maple, Cotton Wood, Carolina Poplar and Red Oak posts that were cut in the Spring and placed in the ground, which after three years showed not the slightest sign of decay, although some of them were cracked above the ground line. Our treatment of telephone and other poles, whether seasoned or unseasoned have given uniformly good results.

TIME AND EXPENSE.

On small jobs the men work in gangs of three. One goes ahead and digs around and cleans the poles, and the other two follow with a one horse wagon or hand truck containing the chemicals (if the line of poles is along the road or on the streets of a city) and finish the treatment. Or the material may be distributed in small sacks to each pole from a hand car, if along a railroad. One gang of men can treat from twenty to thirty, twenty-five foot poles per day. A much larger number of new poles can be treated in a day. The cost of treating this size, depends upon the accessibility of the poles, and whether the materials are purchased in car load lots or not, and the price of labor; but would say the cost would be from seventy-five cents to a dollar per pole, including royalty. We have treated some very large poles worth from \$50.00 to \$75.00 that cost \$1.50 and as high as \$2.50 for treatment. Even this will pay, when we take into

consideration the cost of removal and renewal of the pole. These figures may be reduced on large contracts.

According to the Government Experts the open tank treatment costs 67 cents per pole, not including hauling to and from the plant.

So little attention has been paid by pole users in the past, to the question of the depreciation of their poles and their preservation, that many have not stopped to think or figure, what the cost of treatment should be, in order to be practicable. We submit, however, that it will richly repay any company to treat their poles at the above cost if thereby the life of the pole can be extended ten or fifteen years or practically doubled.

We have poles which were partially decayed when treated and over nine years show no increase in the decay and the protecting device is in good condition. We have no hesitancy in saying from our experience that poles thus treated will have an extended life of from ten to fifteen years, and we believe longer. Furthermore the pole will retain its full strength, at the ground line, during the greater portion of that period. That fact alone is of great advantage in sleet and wind storms.

We have treated several thousand poles for different companies with our method, and it has been positive in its action and uniformly effective. In this paper we have not aimed to draw unfair or invidious comparisons with other methods of treatment, but to give an account of our experience in attempting to solve this very serious problem to users of poles. The poles treated speak for themselves, and we invite the closest and most critical examination by engineers and any who may be interested.

Mr. Folsom: I will say gentlemen that I have here a little model. This is supposed to be the ground line. Of

course the pole goes on down in the ground and comes up in the air. We dig down around the pole here a distance of about 14 inches, and then we put a layer of cement right at the bottom of the excavation close around the pole, and then we form this jacket around and set the lower end into that soft cement, making a receptacle below. Then we put our germicide in here, pack them in with sand and hydrated lime, for the reason that it makes a consistency. Hydrated lime is a germicide but not a very strong one, and salt is a very good one, and I think the day will come when we won't use anything but a good rock salt. There is no use to use a sledge hammer or a trip hammer to kill a gnat when a tack hammer will do it. I find that the germ is a feathery microscopic plant, and it lives just like any other plant. It has to have moisture and some food and heat. Now it gets its food out of this wood, the starches, sugars and albumins in the wood it lives upon. It secretes a bit of enzyme or juice and that, together with the moisture at the ground line sort of digests and makes a plant food out of it. This enzyme is like pepsin that we take into our stomachs that helps us to digest our food. But I am digressing. We put this in here and back it. The lime is to give it a porous consistency, and there ought to be one-quarter lime or a little more. Sometimes we do not put in any and we watch the effects on it, but it is filled up here until it comes to about this point, then we put a collar around there, heavy paper or a metal collar, sheet iron, and we then pour our soft cement right in that collar and it forms this collar around it. As it is laid up we lay old telegraph or telephone wire, a layer too passes up and down vertically, so that you have a double re-enforcement.

. The facts are, we did not use that until about four years after we began. The facts are that in probably 3,000 poles I do not think there is one-half of one per cent. that there is

any cracking about it at all. Cracking does not trouble us; the only effect it has is that the water gets down and it dissolves the chemicals a little more rapidly than is necessary. Of course as it cannot get out into the ground, they must go into the pole. The most difficult pole we have to treat is the one with a large crack going down in it, which allows the water to come in and get down into the cavity where the chemicals are. The theory is, gentlemen, that the capillary attraction of that pole and the osmotic force carries that into the pores of the wood. It is not necessary to have deep penetration, because the germs are on the outside, but as a matter of fact it does go in there. We used to take a little hatchet and hack it around, but that is not necessary. This osmotic force, such as the force which carries the nutrition from the stomach into the little capillaries and vessels of the body, does the work; it is the same force that is universal when carrying the nutrition into the blood circulation. Now, then, you take a pound of sugar, for instance, and put it into a bladder, and you suspend that into a bucket of water. Now there is one part of that sugar which will pass out through that membrane into the water, and there is seven parts of that water which will pass into the sugar—that is osmotic force. That is the same way it does here. It passes into the pole, and we keep the reservoir of our germicide on the outside there. In the other methods they try to have a deep penetration to distribute their supply of germicides in the pole. There are no germicides in the pole there on the outside. I am speaking of the rot that begins at the ground line on the outside, and I am not talking about the butt rot. I want to say this of sulphate of copper; there has been some talk about it falling into disuse by the German Government. I took occasion some time ago to write to the Scientific American, that had printed an article on that subject saying that the German

government had not found the sulphate of copper was a good fungicide, and evidently the report was written by somebody who had not made it a special study and did not know what the facts were. Smith, of Washington, in his work on Bacteriology and Germinology, places ordinary blue vitriol second in the list of germicides. It is not necessary to have a very strong germicide. Now sulphate of copper is a very strong one and it is not so soluble as some of those others and it is not volatile, and it is always there in some form or other. You can't get rid of it. If you take a dose of arsenic and you are killed with it, they can pump out the stomach and take the residue and they will find the same in there; the same with the sulphate, it is always there in some form.

We do not expect, gentlemen, to treat poles in the trunks when they rot clear to the top, inside and out; we can stop the rot at the ground line, but we do not believe that our method is applicable to the above mentioned condition. We treat a man who has a sore finger on the sore finger, and we do not treat him all over for it. Of course in the case of the pole, down there they rot more extensively, and the treatment has to be more extensive, but in the Northern, Eastern and middle Southern states poles rot at the ground line and do not rot, to any extent, above ground.

Here is one statement I want you to take home with you, that is, that poles in these states, above this line, remain good for years, without any treatment; below that point, a few inches, they remain good without any preservation; it is only at that ground line. We said, what is the use of treating the whole pole when the worst place was only at that point.

Gentlemen, we have worked at this for about twelve years. We have treated by this method for over nine years, and I am certainly very much pleased to get this matter

before the convention, the men who do the thinking for the companies. I submit it with the desire that you will ask any and all questions that you please, any that I will be able to answer, but if there is anybody who wants to find out the weak points of this, we are the ones, more than anybody else.

President: Gentlemen, you have heard this very interesting paper on a subject in which we are all deeply concerned, and also the remarks accompanying it. It is now open for your discussion.

Mr. Davis: I attended the Deep Waterway Convention in Chicago last fall, when Mr. Bryan spoke on one day and Mr. Taft spoke on the other day. Mr. Taft's remarks on the deep waterway were based largely on the great necessity to conserve the natural resources, and he went ahead and gave figures showing how many cross ties are used by using railroads, and how much timber would be saved by using the waterways instead of the railroads in handling freight and passengers. He quoted statistics that show that the end is in sight so far as our timber is concerned, and it occurred to me at that time that if we could have something at our convention that would teach us just a little about the preservation of our poles that it might be a splendid thing for us. Now I do not believe many of us know much about this subject of wood preservation. We see the creosoting plants and different sulphate of zinc treatments, plants springing up here and there along the railroads throughout the country; it is an industry that is growing very rapidly. Railroads and everybody is trying to do something to preserve the wood, to conserve our forests.

We have with us to-night Mr. C. M. Baker, and I am of the opinion that he could give us something about the treatment or cost of poles. We just left the subject to the President for general discussion.

President: Mr. Baker, will you kindly give us some of your experiences. Mr. Baker is Superintendent of Construction of the Postal Company and has had long experience in **that** line.

Mr. Baker: We have had a great deal of experience in the preservation of our poles in the Postal System. We have used the creosote, I should say, Carbolonium, to some extent, but with not very good results. That is about the only preparation we have ever experimented with. The Postal Company uses approximately of new poles for each year, in my territory, including new lines, from ten to seventy-five thousand per year. In the Western division, from Pennsylvania State Line through to the Arizona Line, and from Duluth to New Orleans, some years we have used as high as a hundred thousand of them.

President: Mr. Baker, will you kindly say what wood you use, principally, and what you estimate to be the average life of a pole?

Mr. Davis: We use in the South quite a number of chestnut poles, and in the North and West principally cedar (Michigan cedar). We figure the life of a Michigan cedar pole at about 12 years: in some instances they last 20 to 25 years. We have lines 25 years of age still standing up, and we have had the same class of poles decay inside of six years in different soil: the chestnut poles in the country in which they grow are about as long lived as the cedar, but shipped from the East, for instance into Ohio and Indiana, my experience has been that the life of chestnut is not much more than one-third that of cedar.

Member: Is it your experience that the chestnut pole in its native soil has not only got a greater strength, but a greater life, even at the ground line, than the cedar pole in its native soil?

Mr. Baker: I think it has a greater North, but I never had much experience in the native soil of the chestnut; that is generally East of the Pennsylvania Line where we get a greater part of that; in the Southern country along the Illinois Central, we have very good results with the chestnut poles.

Mr. Cline: What is the average life of the chestnut in the Southern states?

Mr. Baker: I could not tell you. We have not had control of that part of the Illinois Central for many years. Mr. Groce, I believe, could give you a better idea of the life of the chestnut pole in the South. We have commenced experimenting in the life about four years ago.

Mr. Davis: Did you ever treat the cross-arms?

Mr. Baker: No, sir.

Mr. Fisher: What kind of wood?

Mr. Baker: A long-leafed pine.

President: Did you use any of the Oregon pine?

Mr. Baker: Yes, now, unpainted.

Mr. Greene: I would like to ask if the Carbolonium treatment is a failure.

Mr. Baker: On the few poles that we put in in the vicinity of St. Louis, it showed as much decay at the end of three years as the cedar untreated. We had poles examined about three months ago. Some other companies, I understand, have had very good success with the treated poles with Carbolonium, Pennsylvania for instance.

Mr. Fisher: With reference to the reference to Pennsylvania; do you mean the Pennsylvania Railroad?

Mr. Baker: Yes, sir.

Mr. Fisher: Did they try any carbolonium?

Mr. Baker: Yes.

Mr. Fisher: I understood the Pennsylvania Railroad made an experiment with the carbolonium treatment on probably 50 or 100 poles.

Mr. Baker: Mr. Cellar is here and can answer about the Carbolonium better than I.

President: Mr. Cellar, will you kindly give us your experience? I understand that you have had some experience regarding the treatment of poles with Carbolonium or some other substance.

Mr. Cellar: Yes, we have. We have had a little experience in treatment with Carbolonium and other products of the coal oil tar, and as far as we have gone, they are very satisfactory, because we did not in the start expect that they would preserve poles forever, but that the treatment which we gave the poles is one that is inexpensive, and we expected it to be effective for a certain short term of years. That was the coal oil tar product, which we used on about 110 miles of poles of the Vandalia Railroad. It has been on there five years, and we expect to renew it; it does not cost much. All those poles have apparently suffered nothing whatever from decay, and while we expected that the preservative would be dissipated by the elements in the course of a few years, we find that its presence there after five years is still appreciable. We applied it with a brush, at a certain temperature.

President: You have also tried carbolate-carbolonium?

Mr. Cellar: Yes.

President: What results did you obtain from that?

Mr. Cellar: I do not think there is so very much to choose between any properly prepared product of that kind. It certainly has been on the market long enough so that anybody can make up a composition that will be practically identical with most any other kind. I attempted

the use of this medium at a time when I was looking for a preservative, and of course we all felt that creosoting process was an assured success, and its application in that case was not practicable, and I had looked into other preservative methods at that time to some extent, notably the Burnettizing and climatizing process, and investigation seemed to indicate that application of the chemicals involved brittle-ized the wood fibres, and after white cedar gets to a certain age we all know it is brittle enough without any outside help, so I preferred to experiment with these coal tar products, and I think we have realized all that we could have expected.

President: Mr. McMillan, I think you can give us some information on your experience.

Mr. McMillan: We have used carbolide-carbolenium on perhaps 200 miles of our line, and our experience goes to prove that in the section where we used it it is worthless. We have used tar on perhaps two or three hundred miles of line and in the dry districts, where the tar is not of any particular value.

I was very much interested in this question, because for years I held the theory that was advanced, that the weak spot was just at the air line. In the last few years I find that in the Western section of the Western division a different process takes place than what has been advanced, namely, that the pole rots from the beginning from the bottom to the air line. That has been quite evident during the last year, in which we have rebuilt, owing to our railway being diverted, 60 or 70 miles of line, and we wished to use poles that looked to be well preserved in building the new section. We used an appliance for pulling these poles out of the ground, and poles with outside perhaps half an inch of rot, within six inches of the surface, when taken out were rotted clean through 2½ feet from the surface, so that the pole

was **useless**, and we have not used, in that sixty miles, 5% of **the** poles which were only in the ground about nine years. The pole is perfectly sound from the ground up, and **is** badly decayed beginning from the air line until it reaches **the** bottom of the pole. If Mr. Folsom's method were used in that section, we would have to continue his concrete **down** to the very bottom of the pole, but in using carbolate of tar it has been of practically no value to us in that section, and, as I stated, I was of the opinion that the weak point was, as stated by Mr. Folsom, near the air line, and **he** is right in the majority of cases, but it is not right in this district which I supervise. Our poles rot, beginning from a point five feet below the surface, to the air line. The poles that looked perfectly solid, we found were rotted clean through, from 18 inches to two feet below the ground line.

President: I might say, gentlemen, that the cedar we use in that district is Western cedar, and the life of the Western mountain cedar is considerably less, according to the experience we have had from cedar grown in the Eastern part of Canada.

Mr. Cellar: May I ask what the character of the soil was in which these poles were set?

Mr. McMillan: It is a dry, sandy soil; it is not so very light, but it is very dry, because it is in a district which they intended to irrigate.

President: There is a large amount of alkali in it.

Mr. McMillan: I do not think the alkali affects it in any way; it affects our iron, our ground rods, but does not affect the poles.

Mr. Selden: I would like to ask a question. You speak of this preservative being taken up by capillary force. Does it cause it to go considerably above the collar?

Mr. Folsom: We have known it, on white cedar, to go as high as 12 or 14 inches, and when there is a crack running up, we have seen it to go, in a very porous wood, from 3 to 12 inches, but ordinarily it does not go more than two or three inches past the top of the collar. It also goes down below the lowest cement. We have found there that it permeates the wood, and upon an analysis for it and also under the microscope, we found that it affects the wood down below so that it goes both ways, but not to any great extent.

Mr. Selden: You are sure it goes above the collar?

Mr. Folsom: There is no doubt about it. That was a question we set to solve. We took a lot of poles along an alley that belonged to an electric light company, about two months after they had been treated, and we took out a sliver of wood two or three inches above the cap, placed them in a butter dish, and then on the other side of the alley was a line of cedar poles that had not been treated, belonging, I think, to the Bell Telephone Company. We took out of that a sliver of the wood and put it in a cup. Then we took a one per cent. solution of nitrate of silver and dropped it on each one of these slivers, and in every instance, except perhaps one, there was a reaction, showing that the chemical had come above.

I also nearly lost a horse. There was a pole treated in my pasture. The horse got very sick one day, and I found that it had been gnawing at the wood and opened the pores of the wood and it made him sick; it had got too much sulphate of copper, and slobbered a great deal. There is no doubt about that proposition. Anybody can see it on poles which are treated; some of them will not show it. We had a number under analysis, not a very accurate one, but in the ordinary tests and under the polaroscope test, often

where **the** quantitative analysis would not indicate it the polaroscope did.

The **idea** that Mr. Cellar speaks of occurs to us also, that is, **not** to get a chemical that would injure the fibre of the **wood**. Now salt does not. Anybody who has had any experience with salt in an old salt barrel has no doubts of the **fact** of salt not making it brittle, and especially at the ground line, where there is a certain amount of moisture.

Going back to the carbolenium, I want to say right here, gentlemen, that I tried to make this a pretty thorough study, and find out all the literature on the subject, and there is not anything new in any method, I mean in the penetrating method, from the time of Bolton and 30 years before him down to this time; every single one of the chemicals have been used. There is a little different method of getting them a little deeper in the pole, but all have been used; and I want to say another thing, a very exhaustive report was made in 1885 by five gentlemen who were appointed by the Society of Civil Engineers of New York to make a report on it, and they reported in 1885, and it will be found in their report, and some appendices were attached which give the dollars and cents side of it as well as the mechanical and scientific sides; now you will find that, or a notice of it, in the 1885, June 25th, I think it was, and from that time, gentlemen, up to October, the Scientific American Supplement gives a good deal of this paper and it goes over all these different substances.

Now Carbolenium, we have treated with that, and anti-septine, and a great many of those other so-called germicides. Now I say this not with any idea of competition or anything of the kind, but simply with the idea of finding out what would do the business. Now these are all coal tar

products, as Mr. Cellar well remarked. Carl Crawford, of the Government Service, speaks of them as the coal tar products, and that is all they are, in my experience. Now, in my opinion, there is no method whereby you apply a coal tar product, or anything else in a hot condition or a cold condition to the outside of a wet or unseasoned pole, and why it will not go in. In the first place, it is stated in Bolton, as a fact that was well established among Civil Engineers, that it would not amount to anything. Of course you may have enough instances where it will, but I mean, it will not amount to anything to such an extent that it would justify any company advertising it to any great extent. It is a fact that if you take a given amount of water, and it requires a greater number of heat units to raise that given amount of water to a given temperature than any other substance; consequently, when you apply your germicides—and that is what they are supposed to be—in a hot state to a damp pole, what do you do? You do not heat it in very far, and if you do heat it you heat a very little on the outside, simply make a steam there which is a repeller of the oils and they do not go in to any great extent, hence we do not use it. We use Carboline in our jacket; we can use any of them, the patent covers all of them, but what we try to give out is something to do the business.

I have found poles from Chillicothe to Circleville; they were all treated with Carbolonium, the nicest chestnut poles you ever saw, put in four years ago, and they are rotted half an inch now. There is a country that tests poles. Right along the same line there was white cedar poles that rotted in about seven years, but the life is about 8 to 12 years down there. I want to say to you that I have excellent poles where they were put in in 1896 where they have not rotted in a quarter of an inch; poles put in 25

years ago that are not rotted more than half an inch. I have met the point which Mr. Becker made; we have treated poles that were rotted very low, we did it with a longer jacket. You have to treat according to the disease. If you have a sore finger you do not put a plaster all over the body. Now our aim has been to get a method that would meet a majority of the conditions.

President: We would like to hear something from Mr. Groce in regard to the poles in the South referred to by Mr. Becker.

Mr. Groce: The pole proposition is a very interesting one to all of us, and I expect I know about as little about it as anybody else. South of the Ohio River the life of the pole depends upon the financial condition of the telegraph companies. Sometimes it rots at the bottom and sometimes it is gone and you have bell-less lines. It is a fact that the pole rots in the southern country from the ground line to the bottom, and some, system of treating, such as Mr. Folsom has, I believe in that country would have to be made to cover the entire butt of the pole. The frequent storms that they have in the South make it hard on telegraph poles, and any kind of a treatment that will preserve them would, of course, help, but it must be some kind of treatment that would not weaken the pole any. We have some old red cedar poles down there that have been in 35 years, and they are thinking of taking them out now and trading them off for other poles, as the lead pencil people are after them, and they are about that size.

Mr. Cellar: The best way to treat poles is to make reinforced concrete poles. I am pretty confident that with an adequately equipped factory concrete poles can be manufactured for about the price of white cedar. Aside from the cost of handling and erection, I really believe that the

concrete pole, especially in the middle West, is pretty nearly the coming proposition.

Mr. Chenery: As the hour is now 10 o'clock, I make a motion that we adjourn until 9 o'clock to-morrow morning. (Seconded and carried.)

FOURTH SESSION.

The meeting was called to order at 9:10 A. M., by President Camp, Thursday, June 24th.

President: We are on the eleventh order of business, new business, including the reading of papers and their discussion. We will hear Mr. Kissinger's paper, on Wire Testing.

TESTING AND CARE OF WIRES.

By V. T. Kissinger.

Asst. Supt. Tel. C. B. & Q. R. R.

The value of our wires in service is directly dependent on the percentage of time they are in a working condition, and the amount of business they will carry.

So far as single overhead wires are concerned, the testing and location of trouble is a rather simple matter.

There are, however, various ways of having the local offices perform their part in such location.

In testing telegraph wires, some Wire Chiefs ask the way stations to come in on the circuit, and try them there. Others ask the way office which way a wire is grounded or open. Both of these methods bring unnecessary moves and delays into the test, as, if some office requested to try the wire does not get the Wire Chief, he is very liable to do something that will bring in more trouble and make ad-

ditional testing necessary, or spoil the test then being made. For instance, he may cut in with a defective instrument.

I would suggest that no one be called into the wire, but that the Wire Chief call on the local office to pull out the east or west plug, to open such wire as may be grounded or crossed, or to ground east or west, such as may be open, and when the trouble is apparently located between two stations, that an east and west test be made in the board of each of those stations, which will show if the trouble is or not in the offices. Very many such tests show office trouble that may be cleared by the operator.

In locating an ordinary case of trouble, a good wire chief will not call in any office more than once.

SWITCH BOARD OR INSTRUMENT TROUBLE.

The practice of having the operator remove wires from the posts in the switch board is not to be recommended, and usually brings about trouble at some later day that is hard to explain. These general rules apply to all testing, and a familiarity with the local conditions is of much value.

Trouble being located and referred to the lineman, the trouble should be tested, or "felt for" hourly, or as often as practicable, and when it is figured out about what time the lineman should reach and clear his trouble, very much more frequent tests should be made.

When cleared, a message should be sent to the lineman at the stations each side of him, to notify of clearance, and advise of other trouble; also of any extra trains, which will help him over the road.

The handling of the lineman has much to do with the amount of trouble and the delay in clearing.

By proper efforts, the amount of ordinary wire trouble

may be reduced to the so-called unavoidable, and that trouble due to neglect, will be of a small percentage.

Considering insulation, the train wire is the hardest to maintain in good working condition—being usually the oldest wire—dirty insulators—and being looped into all sorts of buildings.

For the reason that wet weather reduced the working efficiency of train wires, the low resistance relay became popular. That relay had nothing to do with the insulation, but it reduced the resistance between terminals, and provided what might be called a short path between terminals, and a larger per cent. of the current following the line of least resistance, would follow the wire instead of leaking off through the high resistance due to dampness.

The measurement of insulation with the voltmeter, when followed up by having the small escapes removed, has probably resulted in as much benefit as the low wound relay, but the low wound relay furnished immediate relief, while in some cases, several months would pass before the leaks shown by the voltmeter could be removed. Both should be used.

Claims have been made that the insulation figures obtained by use of the voltmeter were not accurate, as compared with bridge measurements. I do not know that any claim has been made that they were accurate, or any reason for a wish that they be nearer than five or ten per cent.

The method is fast and wires may be measured with several stations within a few minutes, with no lost time by reason of interruption, and if the escape shown by the voltmeter are removed the working circuit will be improved.

TELEPHONE CIRCUITS.

Telephone circuits are cut into the regular telegraph tests stations (15 to 25 miles apart) in such a manner that

they may be opened for test; local offices between the test stations are connected on to the main circuit by means of test connectors, so they may be removed and replaced without soldering iron.

The testing of a telephone circuit by telephone and voltmeter is more simple than by the telegraph method because when connected with a wire in trouble, we seem to hear, and at the same time see the trouble; crosses—escapes and high resistance contacts—Cross talk and any foreign noise—Interference. In the testing, all that is done is to disturb or change these noises.

By reason of the telephone being more sensitive, greater attention should be given to secure good connecting joints. Clean arresters, and high insulation.

While it is true that a good telephone circuit will work satisfactorily through wet weather that would practically drown a telegraph wire; the insulation on the telephone should not be neglected, because poor insulation, if not properly distributed, will cause a noisy line and metallic circuits being double mileage, should receive more attention.

The two sides of the circuit being connected together through the instruments at every station they appear on the testing instruments as one wire, and cannot conveniently be measured separately.

Copper metallic circuits with 22 stations, have been measured through wet snow and rain, showing an insulation resistance of less than one million ohms per mile for 107 miles.

The copper and iron wires in commercial telegraph service on the same poles showing about the same insulation per mile of wire, were too heavy to be used.

The telephone circuits worked all right. The Dispatcher said "they sound a little different but not much."

In testing for a ground or escape, the two sides of a pair are opened at the test stations, the same as with the telegraph, except that the wire chief does nothing but listen to the changes in the noise, or watch the voltmeter.

When one or both sides are open, the test office is asked to short circuit the two sides, which amounts to the same as grounding on a single wire.

There seems to be no reason for the use of a ground wire, except to locate high resistance joints.

A high resistance may make a noise similar to that made by an escape on one side, and may be located by short circuiting and grounding at the same time, which may be done at the test stations until it is located between two test stations, after that the lineman with a receiver, may be sent out to short circuit and ground the pair while the wire chief listens.

Unlike an escape or ground, the lineman cannot do his own testing to locate a high resistance.

While the telephone circuit may be a trifle more complicated, and the maintenance cost some what higher than the telegraph, we find the telephone has many advantages that were unknown to the telegraph.

President: Gentlemen, this is a paper that is very interesting to us at the present time, in view of so many of the roads going into telephone work. The Topic Committee have requested Mr. Williams to open the discussion. Is Mr. Williams here? Then Mr. McFarlane is to follow in the discussion.

WIRE TESTING AND THE CARE OF WIRES.

By W. P. McFarlane.

Mr. Kissinger has thoroughly gone over the main points in the matter. His statement that the value of a wire is

directly dependent on the time it is in first-class working condition, is emphatically the point.

The testing of wires for trouble is reducible by the care given to install and maintain wires so as to prevent trouble, unfortunately few of us are in a position to give such care to installation and maintenance as would keep the necessity of testing for trouble down to the minimum.

In their care, wires should have constant, systematic, thorough inspection and prompt removal of all possible chances for trouble, the pole line should be of sufficient strength to carry the wires and be placed where there is least chance for damage or interruption to service, insulation should be kept perfect, joints where made without sleeves should be carefully made and soldered when made, all probable chances for trouble such as leaks, grounds, crosses from trees, guy and other wires or any other causes should be removed or guarded against. Office switchboards, instruments and wiring should be closely watched, and defective apparatus or wire replaced, all connections kept tight and clean, batteries should have a proper location where they can be maintained at an even temperature; dry and cool, their regular inspection and proper maintenance is a preventive of much complaint of poor wires, could such regular inspection and maintenance of wires be given them the locating and clearing of trouble would prove an easy matter as such care carries with it the education of both the men who work the wires and the line force who care for them, in the direction of avoidance of trouble, ability to locate it and develops in them a spirit of co-operation; unfortunately few if any of us are in a position to place and maintain the wires under our jurisdiction in the ideal condition. Expenditures for the material and labor so necessary are curtailed, most frequently by force of circumstances which necessitate economy in expenditures even

at the expense of efficient service. We sometimes think the loss caused by the necessarily inferior service amounts to more than the cost for proper maintenance, but as you all know it is pretty hard to show this. Our trouble problem is therefore greater than it would be under ideal wire maintenance conditions and the prompt location and clearing of trouble is the next thing to be attended to.

Some roads are fortunate in having as a part of their telegraph staff Division Wire Chiefs subject to the Supt. of Telegraph men selected for their ability and equipped with the instrumentalities necessary to locate trouble, arrange for its clearance and make such connections as will give the best service to important business until repairs are affected. Other roads depend on their Division Dispatchers to test wires on their respective districts. However capable the man may be he is generally a busy man, his train and car movements his first consideration and it is rare that even when he has the inclination to locate trouble that he has the time to do it promptly, the result is loss of wires for much longer periods than where there is a Wire Chief whose primary duty is their testing and care.

Mr. Kissinger has fully taken up the methods of testing, these are generally understood by us all, the manner differs but slightly and only because of the greater or less ability of the tester and the men he depends on, as Mr. Kissinger says a competent wire chief makes his tests completely and quickly, he does not have to retrace his ground, such a man knows his wires and his men and by feeling or intuition goes straight to the location; such men are not plenty, however; the incentive for others to equip themselves should be emphasized for such command better salaries and are placed where they have better chances for further education and advancement.

Linemen are one of the most important factors in the testing and care of wires, on their care of them depends the time they are in service; some men are eternally chasing trouble while others aim to prevent it. We should aim to encourage the latter method as fully as possible.

As the necessity for surer, speedier communication increases, and it is steadily so increasing, there will come a realization that to this end proper maintenance is necessary and the expenditures necessary to that end will be looked on as a saving both in railway and commercial service, until then, we must as ever strive to do the best with what is at our disposal and inculcate the same spirit in all under our influence.

Mr. McFarlane: In connection with Mr. Kissinger's paper, he says that his train wire is generally the worst. It has been a habit of mine, because, being an old train dispatcher I know the value of it, to make an effort to appropriate a new wire for the train wire. I have always been able to keep up the train wire one of the best wires in the district in my jurisdiction.

President: Gentlemen, the subject is now open for general discussion.

Mr. Wilbur: Mr. Kissinger speaks of the general circuit scheme of testing. On the Illinois Central we have something like 85 divisions in our district with short circuit buttons, and find it a very simple method of testing for unusual noises of the telephone lines. The button is plainly marked, "For short circuit testing only."

Mr. Kissinger: The button scheme is a new one, and I am glad to know it. I thought I had figured out a scheme, but it is not so good as the one mentioned.

Mr. Wilbur: Of course the buttons don't cut out all the induction noises entirely, but any unusual noises other

than possibly slight induction noises are very easily detected. We have the man at "B" press his button for a second, and if it clears the noise we know that it is beyond him; have man at "C" press his button, and if it does not stop, we know that there is something wrong with the lightning arrester between you and C. The trouble is generally found in the office.

President: The idea of short-circuiting the two wires is to cover such interruptions as a broken wire, or what we might call a low resistance ground, or poor insulation on one of the wires by which the balance is very materially thrown out.

Mr. Wilbur: The buttons will take care of anything except the slight inductive noises.

President: You find that it is more effective than opening both wires?

Mr. Wilbur: No, it is not more effective, but it is a good system, and we are not fixed to open both wires in every office, and don't want to be fixed that way, because that causes a lot of trouble.

President: The circuit which we installed for experiment we put it in the series system, same as the New York Central Road, and therefore cut both wires in every office. We are now installing three new circuits, but have gone into the breach system as we were able by that method to get rid of an additional contact pin for the purpose, but I gave instructions that all permanent offices should be located in the same way so that, if necessary, we could open both wires, or they could be short-circuited. However, we have not arranged for any short-circuiting device that can be put on contact at any time, the same as what you mentioned.

Mr. Wilbur: There is no question or occasion for

trouble to occur in a short circuit, but where you have an open switch there is always a chance for it, the contacts being poor.

President: The way we bring our wires into the office is through a double portion spring jack, and so far have had no trouble whatever in the connection through the jacks. At stations that are only used at intervals—what we may call temporary stations, which may be used two or three months in the year and are closed for the balance,—we simply breach in. Even in our series system we have two offices breached in with the Howlett Co. calling, and that has worked out very satisfactorily.

President: I wish to say, gentlemen, that we have to close up our business this afternoon, because we will have no chance for a session tomorrow. There are two things that we must take up, even if we have to cut out the picnic tonight, and that is the election of officers and selection of next place of meeting. As the new constitution stands, I have not power to go back to that, but the Association can, by vote, take up the election of officers at any time. As soon as the next paper is read, or possibly before, I think it would be quite in order for one of the members to move that we proceed with the election of officers.

Mr. Davis. In order to expedite matters, I believe it would be well to pass by the papers that have been presented by members who are not here. We have quite a few of them, Mr. Jennings', Mr. Teed's, and one or two others who have sent their papers. I think it would be a good idea to simply print them in the minutes and not have them read. I would suggest that we next hear from Mr. Kelsey. Mr. Kelsey has a paper prepared at my request. With the coming of the telephone, we have been receiving literature and information from the experts and engineers who mention telephones, telephone apparatus and the working of tele-

phones in terms not exactly clear to all of the laymen. This paper which Mr. Kelsey has prepared can be put in the hands of our chief despatchers and our ordinary linemen, and it is something that they can understand, something that belongs to the A. B. C. class, so to speak, that anybody can understand, which will be a very valuable thing for us. Mr. Kelsey is here and he is not all satisfied with his paper, but I think it is one of the best things that we have had for a long time, and I would like awfully well to hear from Mr. Kelsey and the two gentlemen that are asked to lead in the following discussion, Mr. Van Etten and Mr. Logan. Mr. Kelsey can either read all of it or any part of the paper he wants to.

Mr. Chenery: I do not want to interrupt the proceedings as outlined by the Topic Committee, but I thought I would mention the fact that the Secretary turned over to me last night Mr. Teed's paper; I believe it is entitled "The Trouble Shooter or the Division Line Man." It bears closely on the paper which has just been read, and if the Association had time I thought it would be well to present that paper in connection with previous one. I only make that as a suggestion. It is not a very long paper, but it would follow in the proceedings so closely with the other paper and, being in close relation, I thought it might be advisable to at least print it in the proceedings.

President: If it is not very long, I think we had better have it now. Mr. Chenery, will you then kindly read Mr. Teed's paper?

THE DIFFERENCE BETWEEN THE TROUBLE SHOOTER AND THE DIVISION LINEMAN.

By H. D. Teed, Supt. Telegraph, St. Louis & San
Francisco Ry.

The Topic Committee has called upon me to present a

paper explaining the difference between a Trouble Shooter and a Division Lineman. While these two terms may seem to be synonymous, there is quite a difference in the duties and qualifications of the two men.

The Trouble Shooter has a great advantage over the Division Lineman inasmuch as he has at all times means of direct personal communication with the Wire Chief, while the Division Lineman must depend upon an intermediary and possess absolute confidence in the Wire Chief. The Trouble Shooter is invariably assigned regular hours and observes them, while the Division Lineman responds almost instantly on receipt of notice of trouble, whether it be day or night. So long as the Trouble Shooter holds no notice of trouble he does not worry. Not so with the Division Lineman; he must anticipate the possibility of interruptions and remove the cause before valuable circuits are lost to the service.

The picturesque term "Trouble Shooter" seems to have originated with, and is confined almost entirely to telephone practice. His duties are principally to remove trouble on the telephone line, either outside or inside work. He may be given the location of wire trouble by the Wire Chief, usually after a bridge test, showing the location of the fault, its nature and the circuit involved. He may also be called up to repair a bad order telephone instrument or replace a blown fuse. This work done he receives an O. K. from the Wire Chief, makes a work report and there his responsibility ends.

The physical condition of the line does not interest him, although if he is of good material, a bad piece of line or faulty construction would no doubt elicit a remark from him to his superior, which would be reported and acted upon by another division of the Maintenance Department. With large telephone companies it is frequently the practice to

have employes whose particular duty is to install the telephone after the Construction Department has built the line up to the new station. Their work in turn is checked by an Inspector who O. K.'s it or makes an adverse report as to the character of the work.

The qualifications of the Trouble Shooter are as follows: Sufficient knowledge of line construction to locate accurately any particular circuit and make neat and substantial repairs on the line in conformity with construction and repair rules; familiarity with the rudimentary parts of telephone cable connections; familiarity with instruments common to the company employing him. Physical strength can be sacrificed to mental quickness as his labors do not call for the use of powerful physical force.

Let us turn to the Division Lineman, who is made a part of this discussion. What are his duties, qualifications and responsibilities? This is perhaps best answered by using a concrete illustration which is no doubt typical of the telegraph maintenance force on many of the larger railroads.

The Division Lineman should be intelligent and fairly well educated, able to write a legible and comprehensible letter; he should be sufficiently strong physically to handle heavy work which the exigencies of the service may require; possess a fair electrical knowledge; and be familiar with telegraph and telephone apparatus so that he can promptly repair ordinary defects. Without these requisites you will find a man in the service whom it will be necessary to pass by some day when selecting a general foreman and seeking a man for promotion. So much for the man.

What, then, are his duties and responsibilities? As most of the Railroad Companies work under reciprocal contracts with the Telegraph Companies whereby the telegraph line is to be maintained by the Railroad Company in return for certain considerations, it is readily seen that some arrange-

ment must be made to handle the work in a systematic manner. This organization usually consists of a General Foreman or Chief Line Repairer, who reports to the Superintendent of Telegraph and has immediate supervision over the Division Linemen as well as the repairs and maintenance of the pole line.

To the Division Lineman falls the responsibility of repairing breaks and other interruptions to the telegraph wires reported to him by a Wire Chief having charge of the wires in his particular territory. This is his paramount duty; and in case of unusual damage to the line due to sleet storm, wash-out or other cause, he must cover the affected territory and make prompt report of conditions, advising what additional assistance and material are needed and direct such labor as he can command, until relieved. It is under such circumstances that we recognize most fully his merit. Second, the current or general repairs, such as replacing broken glass, renewing poles and cross arms when necessary, cutting out bad joints where found, pulling out slack, trimming trees adjacent to the pole line where interference may cause serious leaks, and remedying numerous other faults to which the telegraph line is subject. He should observe his line closely and promptly report contemplated telephone crossings and other encroachments on the railroad right of way.

He should inspect each office on his district each month, if possible, and should not allow over two months to intervene between inspection of any office, reporting the condition of the office to the Superintendent of Telegraph through the Division Operator and General Foreman so that any unauthorized changes may be promptly corrected to prevent future trouble. He is also required to inspect the local battery and see that it is renewed when necessary and that a sufficient amount of material is on hand to renew it. He is

required to see that on instruments other than those authorized are used, or any connections made to the switchboard or other apparatus that have not been authorized, that the switchboard is correctly marked as to wire numbers and directions, that all connections on the switchboard are tight, and that the ground is efficient.

He will be called upon by the Division Operator, with the knowledge of the Wire Chief, to open and close offices, and given disposition of instruments and other equipment. He must possess sufficient knowledge of his territory and the local conditions to enable him to determine before leaving his headquarters what material will be necessary in order to cut in an emergency office promptly.

He should be located at a point with due regard to the train service, and where he will be able to reach any point on his territory with the least possible delay. Other things being equal, it is preferable to locate his headquarters at a point where he has main battery to maintain. Where the main battery is not maintained by the Telegraph Company at its exclusive offices and where it is necessary to maintain a large number of gravity cells this work falls to the Division Lineman. He is required to keep the main battery in good condition at all times and keep sufficient material on hand for complete renewals at stated intervals, also to look after the battery refuse, and when a sufficient amount has accumulated notify the proper authority for instructions as to the disposition of it. On some roads he is also required to distribute the local battery for stations on his division. This in itself is no small task. While he should see that there is a sufficient amount on hand for renewals, at the same time, he must not be extravagant in the distribution, as this material is frequently lost or stolen if allowed to accumulate at any station.

He is also provided at his headquarters with a supply

of line material for making current and emergency repairs, and it is his duty to see that this stock is replenished from time to time. This is best accomplished by the rendition of a monthly statement showing all material on hand, work contemplated for the succeeding month and what is needed.

From the foregoing it will be readily seen that the Division Lineman has a multiplicity of duties and responsibilities which require the exercise of considerable mechanical skill as well as possessing a variety of knowledge. He has of necessity to be more expert than his predecessor of a few years ago and he will in all probability be required to extend his knowledge still further with the extensive introduction of the telephone in railroad work which is now becoming quite general; while it would seem that the requirements of his brother the Trouble Shooter will not have changed to any great extent.

The thought naturally arises, which of these two men has the better opportunity for advancement. In my opinion the advantage rests with the Division Lineman. During his service as Division Lineman he has acquired a knowledge of railroad business, and having come in almost daily contact with the division officials, who are usually ready to recognize efficiency, his opportunity for advancement depends almost entirely upon his aptitude to absorb knowledge and ability to apply it. On the other hand, the Trouble Shooter may have gained a vast amount of knowledge in connection with his particular line of duties, but the avenues open to him for advancement are few and far between. He seldom comes in contact with the officers of his company and rarely has an opportunity to demonstrate to his superiors his knowledge.

I think that all will agree with me that within a short time the difference between the Trouble Shooter and Division Lineman will be plainly apparent to all.

Chairman: Gentlemen: Mr. Cline, of the Atlantic Coast Line has been requested to lead the discussion on this paper.

Mr. Cline: When I accepted of the commission of the Topic Committee to discuss this paper, I understood that Mr. Dornberg, of the New York Central, would lead in the discussion, and thought that my part in it would be to largely learn from those gentlemen the valuable things they had to present. That is, we do not know very much about the Trouble Shooter, as he is described in this paper. He is either a skilled assistant to the division lineman, as we call it, a station lineman. It seems to me that the difference is one largely of degree, and that the Trouble Shooter should by degrees become efficient as a station lineman.

The time of the convention is short, and as I had not known the contents of the paper but a few hours I have not had time to prepare myself to make any sort of intelligent discussion of it before you. For these two reasons, I think I had better leave the matter open to the discussion of the others.

President: Gentlemen: The paper is open for general discussion. We would be glad to hear from some of you regarding it. Mr. McMillan, have you anything to say?

Mr. McMillan: With us the lineman is the whole thing, not having got what is known as the Trouble Shooter, but I let a point go by in connection with telephones that might come up under this head and might be worth considering, and that is that with the installation of the telephone it might be well if there were some uniform system of literature with which we could provide our linemen in order that they might become acquainted with the new systems of telephones. I think that if some uniform system, from an educational standpoint, could be appointed, from the present standpoint it might be a good thing.

Mr. Davis: The Topics Committee asked Mr. G. A. Dornberg to lead the discussion on this subject. Mr. Dornberg has had probably as much experience as any man here with linemen, and has been Chief Lineman of the Pennsylvania Lines West of Pittsburg many years. If he is present I would like to hear from him, and think everybody else would enjoy it.

President: I must apologize to Mr. Dornberg. In the Telegraph Age list of papers which I was following it did not give Mr. Dornberg's name, and I called on Mr. Cline first. Is Mr. Dornberg here?

Mr. Davis: Mr. Foote, of the Sunset Road is not here.

President: Mr. Groce, have you anything to say on this subject?

Mr. Groce: The Telephone and Telegraph business as it relates to the operation and maintenance of the line has undergone a considerable change since we started into the telephone business on a somewhat extended scale. I have been trying to figure out some plan that would yield good results, and I only feel like stating that we have started it in order for the members to criticize it, and in that way give me some further points. We continue our linemen as we had them before we got into the telephone business, but our linemen do not take care of any main line batteries nor of any inside office work whatever. On the six thousand miles that we have we divided the territory into four sections of approximately 1500 miles each, and the main batteries are taken care of by one man in each 1500 mile district, who has no other duties to perform. We have on the Northern and Southern lines office gangs which are made up of men who do nothing but wire and take care of the inside working offices. The line men take care of the telegraph and telephone wires of the pole lines, under the supervision of the general foreman, and the men we are putting on to take

care of the telephones are under the supervision of the assistant superintendents of telegraph. We have put on each division a special telephone maintainer; North of the Ohio River we pay those men \$85 a month, and South of the Ohio River \$100 a month on account of the different conditions of the country, the living. We have not had enough experience with it to test it out, but it is doing very well. We have made some tests with the volt meter as a measuring instrument for trouble, and Middleditch Bros., of Chicago, have developed an apparatus which costs \$150 which is regulated for testing and appears to be a meritorious machine. We have purchased ten of these, and the first one has been delivered but have not had enough experience with it to tell whether it is going to be the proper thing or not. It is our idea, however, to have this telephone man of the division located at the most central point, and as a general rule he will test every morning all of the telephone wires, and it is then up to the division lineman to clear any trouble on the line. The Chief Dispatchers at the general headquarters, among the larger divisions the Chief Dispatcher has a Wire Chief, and in these places he is the chief operator. They report their troubles to the linemen and they are cleared by the lineman on districts where the trouble is outside of the offices. My idea is that this telephone man, being at his instruments in the office to detect whether the trouble was in the office or on the line, and if in the office the telephone maintainer goes direct to that office and takes care of it himself. It may be found that they will take a little more time to clear trouble than is advisable, but it is my opinion that separate consideration of the inside and out will reduce the trouble and an organization of that kind can take care of the entire work. My experience with linemen has been that the man who really appears to know the most is not the best man to keep up

your **wires**. They get an extra amount of information about **telephones**, which is a very desirable thing, but when they **get** that they are too good to climb poles and put on glass and fix cross-arms; therefore I prefer the husky fellow who does not know so much about telephones but who will take some pride and go up there and fix up things in good shape.

Mr. **Ryder**: Our own experience so far has not demonstrated fully to my own satisfaction whether it is desirable or necessary, the separating more or less of the two classes of service, telephone and telegraph, and up to the present time we have made no attempt to make such separation. Our regular linemen are handling the telephone work as well, and apparently satisfactorily, as satisfactorily as it seems to me now we could expect any one to take care of it. It is true that the introduction of the telephone in any extensive degree will undoubtedly require additional help, because the condition ordinarily is that the telegraph lineman has got all that he can possibly do, and you give him some telephones, and that is the last straw. We have put on some additional men, but in doing so we have simply divided the territory, or reassigned the territory, and we practically have no special telephone men so far as caring for the apparatus is concerned after its installation.

Mr. **Griffith**: It may be interesting to know a little bit of what is going on in connection with the telephone service. We have been in operation now for several months, and I had in mind, at its very infancy, the maintenance of the telephones on the lines before they were installed, and I selected from our force anywhere between New York and Chicago, a lineman, or trouble shooter as he is called, who was also a telegrapher—not necessarily a first-class operator but sufficient to test wires, and we educated him in the use of the galvanometer, then we started him out on the road

installing the telephones and selectors so that he would become familiar with all the local conditions in every office on a certain division. He was instructed to and did make a galvanometer test of the line each day before it was put in service, until he became proficient in locating and detecting any poor insulation, and then we made him the supervisor of the telephone and telegraph circuits over that respective division with headquarters at the terminal or despatcher's office. His duties are to test these wires with a galvanometer at certain intervals and to keep the line, so far as insulation and conductivity is concerned, up to its maximum condition at all times. He also controls and inspects all the offices at certain intervals, makes any repairs that may be necessary, having been educated to do so in the selector's or telephone company, supplied with sufficient apparatus, etc., and he has a little shop where he keeps all his little material. When he is not busy testing the wires he is working in the shop preparing odds and ends that he has picked up to be replaced, and we find that he is a pretty valuable man, and so far with that inspection we have had no serious trouble, as he has kept them clear before they became serious. It is my experience that a man of that character, who can also watch the telegraph wires and patch the telegraph wires, makes a good system.

Mr. Kissinger: While, as Mr. Groce said, we always need a man with a strong back, we have been fairly successful in getting an all-round man, and it might be of interest to know how we had secured about eleven of them that are now covering our telephone district, that is, the small towns, we will say, of six or seven to fifteen thousand for from one to two telephone companies, and we find that the telephone lineman, or trouble shooter, or whatever he may be, working for these telephone companies, is more or less of an all-round telephone man. He has to understand inside work,

switchboards, know about adjusting all kinds of trouble. He must know it. He is not paid by the telephone companies so highly that we cannot secure his services and put him in one of our construction gangs where sometimes two months is enough; others run four or five months. They become after that time familiar with the construction work that we have on the railroad, the telegraph company; they have a good idea of everything we do and everything we want, and we find that he makes a good all-round lineman, and we have been able to cover our telephone district with that sort of men. He is a good inside man, does neat work; he knows about cables, lead and aerial. He can pick up enough telegraph instrument work to get along very nicely and all these eleven telephone men, every one of them, can do anything that the regular telegraph lineman can do, probably not so much experienced, but he can do anything else, that one of our old time linemen can do. When these so-called telephone men were being put in service they were the means of getting the regular lineman started, who wanted a little more help so the that he could become proficient in both branches, and I found that it was a good plan to put it in his way; for him to help install and get these men mixed together so they would rub off on one another something that would do each one of them good. There is a lot of detail in that, but it will work out; if you will help the men they will help themselves.

President: I might say that in our system we intend putting in a telephone inspector at each of the sections where we are installing telephone equipment, for train despatching. It is altogether likely that these men will be able to look after more than the one circuit, but owing to the fact that the circuits we are installing now (will have four of them this year) are very widely separated from each other, we will have to have one man for each section. I am pretty well

satisfied, though, from the experience that they already had that one man will be able to look after two or three circuits if they converge to one point.

Mr. Kissinger: I would like to ask Mr. Groce about how many cells one of his battery men can take care of if it is in good shape, and, if his battery is located many cells in a place or whether it is widely scattered.

Mr. Groce: Each of the four men take care of about three thousand cells. They have from 110 to 475 located at different points. There are some few places where the local batteries amount to not more than ten cells, and then sign contract with telegraphers that releases them from taking care of batteries where there are more than ten cells. In general we have these battery men take care of them in two or three isolated cases where it would make unnecessary difficulty.

Mr. Kissinger: I want to say where there is a large amount of batteries in a district that if the lineman can be relieved of the care of that battery he will appreciate it very much, and is willing to do anything else. I have found it, like Mr. Groce, to our advantage to have a battery man, although our man takes care of a little bit more battery than the man he mentioned, but mine are close together, and are more easily taken care of. He would take care of about 4,000 cells.

Mr. Davis: If I am not entirely out of order, I would like to say that several gentlemen have asked me, "What about Mr. Fowles' paper?" A few of them have sent their money to me to be turned over to Mr. Fowle and have also placed their order for copies of the paper. I had mailed to me from my office a complete copy that Mr. Fowle turned over to me, along with a letter addressed to this convention, but unfortunately the thing has miscarried in some way and I have tried to locate it but cannot find it. I re-

ceived a letter from the D. Van Nostrum Co., of New York, the company publishing Mr. Fowle's paper, and they say the books will be ready for publication not later than July 10th.

President: We have a paper by Mr. Kelsey, on Telephone Construction.

TELEPHONE CONSTRUCTION.

By J. C. Kelsey.

For several years there has been an insistent cry for standard telephone apparatus. Every effort on the part of any organization toward this effort, has been met with opposition on the part of the various manufacturers, who seem to have the groundless fear that standard telephone apparatus means the output of one particular factory.

Standardization: Such fears are not only groundless, but foolish. Standardization does not involve apparatus as much as it does the arrangement of it. The demands of standardization are simple, because the consideration alone is balance. A balanced circuit simply means one which will resist extraneous disturbances, and give the transmitting circuit the best possible path.

Transmission: Transmission is divided into two general groups—the first and possibly the older, is the magneto telephone or local battery method—the other is the common battery method which came into vogue in 1898.

Local Battery Telephones: Local battery telephones remind us of steam railroad conditions, in which each unit has its own power of motion. The two dry cells, working with the transmitter, constitute the locomotive feature.

Common Battery Telephones: Common battery telephones remind us of electrical railway conditions, in which each motor unit is propelled by a central power. The trans-

mitter, acting with the central battery, constitute the powerhouse and motor feature.

Rating of Systems: Often managers of telephone companies, in changing from local to common battery, are disappointed temporarily, in the transmission. A local battery telephone, with new cells, may be rated at 100 per cent. for sake of comparison. The batteries run down enough to lower the local battery efficiency to 60 per cent. A common battery telephone will be constant, and stands in our relative scale at 80 per cent. It is plain that local battery telephones, newly equipped with batteries, are superior to common battery. You can prove it easily.

Wastefulness: Telephone service, compared to all other wire transmissions is the most wasteful method. Of all the energy expended in the transmitter circuit, but one-half of one per cent. of it is available at the receiving end. But the telephone receiver is a most marvelously sensitive instrument, and interprets the surviving electrical force as human speech, clear enough to be plainly understood. It teaches us that quality and not quantity is the goal we are seeking.

Classification of Local Battery: Local battery telephones are divided into two general classes—series and bridging.

Series Telephones: The series telephone has the usual standard apparatus, except the ringer and generator. The generator has a higher armature resistance and greater number of turns, while the ringers are wound to eighty ohms. On a series party line, you are compelled to talk through the inductive resistance of eighty ohm ringer coils. The damage to transmission can be avoided by bridging a one-half microfarad condenser across the ringer coils.

While the manufacturing output of series telephones equals the four bar and five bar telephones, the series telephone may be said to be an obsolete type, from a party line standpoint, because its circuit arrangement is not a balanced

one, and it can not cope with extraneous electrical disturbances.

Bridging Telephones: The bridging telephone is an example of the survival of the fittest. The bridging telephone is put out with three, four or five bar generators, and with 1000, 1600 or 2500 ohm ringers. The standard average type is one equipped with a four bar generator and a 1600 ohm ringer.

The bridging telephone permits of a balanced line, and is thereby most fit for efficient transmission. There is nothing so disturbing to telephone transmission as a buzz or hum of a distant dynamo. With a well-balanced circuit and insulation in good condition, there is no reason why a bridging line should not be absolutely quiet. We have examples of ordinary perfect lines being made noisy by the series alternating trolley system, and occasionally an accidental ground on the 2200 volt circuit of the average small town lighting circuit makes all the telephones noisy. However, the latter effect is only temporary. It is a good rule to look up your paralleling power and lighting wires when your own lines are disturbed.

Condenser: The great trouble with bridging party lines is that someone leaves the receiver off the hook, or too many listen, so that you can not ring the bells on the line.

This is easily remedied by placing a one-half microfarad condenser in the receiver circuit. This little condenser automatically presents a high resistance to low frequency ringing currents, and a very low resistance path to the high frequency voice currents.

Special Receivers: Do not waste your time on special receivers, or go to the extra expense. The ordinary receivers range from 70 to 90 ohms, and there is very little to gain by increasing the windings. It is just as possible to overdo the

thing as it is to do the opposite. The middle ground is usually the best.

Furthermore, the replacement of a special receiver is difficult. Assuming that the special receiver is better, the replacement by a temporary receiver might offer an element of danger, due to poor hearing.

It is better to stick to standard devices.

Push Button: In fact, the farm line usually serving 20 or 30 telephones, not only uses the condenser to help the ringing, but goes farther, and a push button is put in so that the exchange drop or bell may be secretly operated, and connection gotten without alarming all the line subscribers. With this arrangement, every subscriber could be listening, and it would not interfere with the signaling of the central office. The condensers help the subscribers to ring each other on such a line. As you have possibly heard, the farm ladies will tie the receiver to their ear so they may knit or peel potatoes, and still be familiar with neighborhood affairs.

Generator Armatures: Three bar series generators are wound with 330 turns of No. 34 wire, and have 350 ohms of resistance.

Four bar bridging generators are wound with 3000 turns of No. 31 wire, and have 150 ohms of resistance.

Five bar bridging generators are wound with 1500 turns of No. 30 wire, and have 120 ohms of resistance.

The two latter are built for heavy work, and will easily operate 40 ringers on a long line.

Local Battery Transmitters: For this work, transmitters should have a comparatively low resistance and should average close to twelve ohms. One great manufacturing house made its reputation on an eight ohm transmitter for this service.

You hear considerable argument for high resistance

transmitters for this work, but it is all a mistake. There are places where such practice is justified, such as a home where only short calls are made, and it is important to save battery current.

But in railway work, any danger or risk of poor transmission due to effort to save battery, would be nothing short of suicidal.

Types of Transmitters: There are two general types of transmitters—the solid back and the so-called reversed type.

One prominent superintendent has compared the solid-back to a belted engine and generator, and the reverse type to a direct connected set.

The reverse type simply incorporates the carbon cup directly in the diaphragm itself. Such a transmitter will not pack, as usage sets every particle into motion.

The oscillograph reveals that the reverse type, or diaphragm cup type, shows presence of tones not found at all in the solid-back. It is these extra tones that help voice recognition. Voice recognition is one of the prime requisites demanded by railway interests, particularly in train despatching.

One dry cell connected to an eight ohm reverse type transmitter will do as good work as three dry cells connected to a 24 ohm or more transmitter.

Two dry cells, connected to a twelve ohm reverse type transmitter, stands today as the standard of transmission.

Receiver: The ordinary two-pole receiver, averaging eighty ohms, is the standard. Keep your devices of standard resistance. They are easy to interchange.

Either hard rubber or composition shells are used—composition shells are used exclusively by the independent trade.

Receiver Hook: The device should be punched brass, as

should all other parts. The use of steel and white metal should be prohibited where brass can be utilized.

Ringers: As railroads will use copper for long distance service and iron for short haul work, a ringer working its best at 15,000 ohms should be standard. Ringers adjusted for 60,000 and 80,000 ohms will not ring so well.

Generators: The generator bars should be carefully rolled by suitable machinery, so that the fibres of the steel will be preserved. It is well known that careless bending of steel will prove ruinous to its electrical and magnetic properties.

The armature should have the smallest air gap, consistent with good mechanics.

Lightning Arrester: A simple lightning arrester should be used, either on the telephone or near it, on account of the feature of contributory negligence being held against your company. You know everybody considers a railroad a just victim. People want railroads to come to them and make their property valuable, and then want them to support them too. Too much attention can not be paid to the question of lightning protection.

Induction Coils: The subscriber's induction coil should have a primary winding averaging .35 ohms, and the secondary of 35 ohms. The winding should also be impregnated with paraffine in vacuum. This will help to resist burn-outs from divers causes.

The operator's induction coil has a primary winding of .35 ohms and a secondary winding of 200 ohms. The high resistance of the secondary is necessary, because the operator would otherwise have a bad cutting down effect when listening in on a conversation.

COMMON BATTERY TELEPHONE SYSTEMS.

There are two general classifications—the repeating coil system used by Bell interests, and the retardation-condenser method used by the independent interests.

The peating coil method may be properly called an “electromagnetic system”, while the retardation-condenser system may be described as the “electrostatic method.”

There is no difference in transmission between the two systems.

Toll Connection: Common battery systems connect with long distance lines by means of a repeating coil and condenser arrangement. This recalls the well known law that telephone systems of different characteristics should only be in inductive relation—otherwise balance will be distributed and other disturbing factors will enter in.

Some systems use 40 volts, some 30, others 22 and 20. The results are identical as each system equalizes the resistance of its retardation coils. These retardation coils individualize the circuits, and thereby prevent cross-talk.

Battery Supply on Toll Connection: In toll connection, it is customary to increase the amount of battery flow to subscribers' telephones. In other words—the local subscriber talk does not require as much current as the long distance connection.

Common Battery Transmitter: The average resistance of the common battery transmitter is 100 ohms.

PARTY LINE SELECTIVE RINGING.

If a terminal switching system is desired, and economy of wire space is necessary, the harmonic system of selective ringing is recommended.

The harmonic system makes use of four frequencies— $16\frac{2}{3}$, $33\frac{1}{3}$, 50 and $66\frac{2}{3}$ cycles per second.

The ringers are of the polarized type, and the attunement is effected by different weights of bell tappers.

Four full metallic stations can be used without any interference between stations.

If it is found that eight stations are necessary, the earth can be used as a return, and each of the eight stations can be called without disturbing the others.

This system has been in use for two years in the Rock Island yards of Chicago, and the switchboard being placed in a central position, made some most remarkable wire economy.

The harmonic selective system is, of course, confined to telephone switchboard service.

TRAIN DESPATCHING TELEPHONE APPARATUS.

Such apparatus is necessarily confined to long lines, and the service somewhat resembles a heavily-loaded party line. It is essential that such service be selective.

The apparatus for transmission purposes is the standard apparatus used by telephone companies.

Such systems must be of a bridging nature, since any series arrangement for telephone purpose is foreign to modern demands. Not only does a series arrangement have a bad effect upon transmission, but there is an added danger from lightning destruction. Each side of the apparatus has to be protected.

The bridging system is the outcome of years of experience, and stands as a climax, not only in telephone matters, but in all electrical usages.

Conclusion: The present methods of wire transmission can hardly be said to be permanent. Some day devices will be made which will deal with more tangible current values, and step-up and step-down methods can be made use of.

We are approaching nearer a real long distance power proposition, where we can raise pressure values, and lower them, and offset the effects of capacity just as in power practice an over-excited synchronous motor offsets impedance.

Electrical engineering deals with currents of one frequency—either 25, 33, 40, 60 or 133 cycles per second, but in each case always singly.

Telephone Engineering deals with electrical currents of many frequencies, each one acting individually and separately, and each one performing its own particular duty.

When one imagines all frequencies, ranging from 50 to 5000 cycles, surging along as electrical currents, he has reason to wonder how any intelligible sound can be carried.

The higher frequencies succumb to the capacity of the line more readily than the lower one, hence conversation through Commercial Cable is limited to 35 miles and 1200 miles on open wire, because of the fact that these numerous currents do not finish as they start. In other words—they become distorted. Hence the failure to recognize voice or to interpret speech.

To overcome this the Bell interests use a Pupin Coil, which is a device for offsetting the distributed capacity of a telephone line by means of distributed impedances, thereby giving the lower frequencies the same chance to finish as the higher ones.

However, much opportunity is offered for improving telephone apparatus, and however much revolutionary invention the mind can contemplate, we may be assured that voice transmission is the final and highest point in the evolution of communication.

President: Mr. Van Etten has been requested to open the discussion on this paper.

Mr. Van Etten: Not expecting to be here, I wrote my little argument and sent it to Mr. Drew. To save time, I will read it.

Mr. President and Members: The paper just delivered by Mr. Kelsey, is a very able one and contains a great deal of information. I cannot say that I agree with Mr. Kelsey, in the argument, "That standardization does not mean the output of one particular factory," so to speak. I believe that the adoption of a certain standard of construction for telephone apparatus complete, would mean the out-put of one factory or would be termed at the present time, "a telephone trust."

I believe however, that the efficiency of a telephone instrument, will result in that particular make of telephone apparatus, being adopted as a standard by the railroad company, that determines by actual service its efficiency over others.

I also think it better to have your road equipped with one kind of telephone apparatus, and to stay with that particular make of instruments until you find another make that is more efficient. Competition is the life of business and the "maxim," don't try to kill your competitor, but try to exceed him, is a good one.

Standardization to accomplish a balanced circuit, would be good practice, but I believe it should be accomplished, rather through line construction, than by instrument construction.

I believe in having a standard of line material for line construction, but I do not believe in one standard of telephone apparatus, it would tend to discourage competition, and would lessen the efforts to improve the telephone, in

order to excel competition in the telephone field, it would so to speak, discourage the inventive ambition of mind to improve and accomplish more efficient telephone transmission.

Railroads have standardized their car equipment and road way construction to a great extent, but no great effort has been made to standardize their locomotive power, this is undoubtedly due to the fact that locomotive efficiency, is being constantly improved upon and to attempt to standardize, would be considered folly. I believe the same can be said of telephone apparatus. I think the same is true as to the selective signaling devices, each maker of the several different apparatus now in the field will strive to excell the others and to attempt to standardize now any particular make of apparatus, would be a mistake.

President: Mr. Logan will kindly continue the discussion.

Mr. Logan: From my view point I would say that Mr. Kelsey has not left much of an opening for discussion of his very interesting paper, but he treats, and very minutely, the construction of the telephone, as it stands today, in his modern, up-to-date form, which is obtained not only from a very extensive use but from real experiments and tests upon the part of telephone engineers since its inception. As the telephone is today a very important subject before this convention, I think that the paper we have just had the pleasure of hearing will prove very beneficial to most of us.

Mr. Ryder: I want to take issue with Mr. Kelsey in the very mild statement he made in paragraph headed "Wastefulness," in which he mentions the sensitiveness of the receiver and the last that he mentions; he says that it is "quality not quantity, which is the goal we are seeking." Now I have a "hobby" and like to ride it, and one of the

angles of that hobby is the thought that we want both. Evidently from the results so far obtained in the experiments that I know of, it is an evident impossibility, but I am an optimist and we want our telephone concerns to give us both quality and quantity. Now particularly, I want them to give quantity enough so that the despatcher need not wear the harness; let us have quantity enough so that the despatcher's receiver can be five or six inches from his ear, we will say, and he will still hear as well as he does now. Gentlemen of the telephone companies, that is the thing that we wish you would do.

Mr. Kelsey: The Scriptures say, "You cannot serve two masters." We have not been able to do that yet in the telephone company. We are trying to make it that loud so that you can hang the receiver on the wall.

Mr. Chenery: I have been requested, and I take pleasure in saying that Mr. B. A. Kaiser, of the telephone company, advises that he has more proposed copies of the new agreement between the telephone company and the railroad companies, and while he does not expect any discussion of that, and it is a long agreement, but it might be well for the active members present to understand that Mr. Kaiser will be very glad to turn over to you one of these proposed agreements. I make this announcement for the benefit of those members.

President: Gentlemen: Those who are interested in the contracts with the telephone company will please bear this in mind.

Mr. Ryder: This is a clear evidence of the fact that "the world do move."

President: The first three papers on the list are not here, so we will have the paper by Mr. Loveridge on "Dry Batteries."

Mr. Rooke: Will there be any further discussion in connection with telephone train despatching at any future time in the convention, or will there any take place in connection with the present paper?

President: Mr. Rooke, I might say that the present paper does not deal with the question at all. The main business we have before us now is the reading of this paper and the election of officers and selection of next place of meeting, and this afternoon it is proposed to hold a Lodge of Sorrow, about half past one. It may be the desire of some of the members that we hold a sort of executive session; outside of that, if we have any time to spare, it might justly be taken up with the question of telephone despatching.

If it is your pleasure now, we will hear from Mr. Loveridge.

DRY BATTERIES.

By F. H. Loveridge.

It is not the purpose of this paper to go into a technical description of "Dry" cells, but to give some of their characteristics, to indicate what classes of service they are best adapted to meet and to point out some of the precautions that should be taken to insure the best results in practical working. So far as the user is concerned a "Dry" cell might be termed "An original package" sealed up tight and must be accepted for better or worse, as received from the manufacturer. The user of "Dry" cells cannot hope to improve or replenish them, though schemes of this nature are continually being proposed. None of them so far as I am aware over proved to be of practical utility.

A "Dry" cell is only so in name for there is a considerable amount of moisture absorbed in the various ingre-

dients, the moisture, however, is supposed to be all absorbed and not to be found as a liquid in any part of the cell.

The zinc containing cup used almost universally serves the double purpose of an electrode and an air tight receptacle in which are packed the necessary carbon and manganese dioxide moistened with the particular solution which each manufacturer prefers to employ.

A "Dry" cell is classed as an "open circuit" source of electrical energy and though this statement seems contradictory, still it is justified from the fact that the "open circuit" condition is the one expected during the greater part of its serviceable life.

The electrical energy of the cell is, generally speaking, a certain quantity and so long as it remains on "open circuit" none of the energy is drawn out. When the circuit is closed, however, energy is given off and the sum total is diminished correspondingly. It should be explained that a "certain quantity" of energy in the cell is intended to imply definite service conditions—as these conditions vary the available energy will vary and between wide limits.

In making a "Dry" cell the aim is to so construct it that there is a balance between the various chemical elements and so long as this balance is maintained, the cell is inert. When this balance is disturbed, either because of a closure of the circuit through an external path, or interaction between the contained chemicals a change will take place, which cuts down the available output. This interaction takes place when cells are "on shelf", which means the period during which they are stored preceding placing in service. In the course of time it will be noted that both the E. M. F. and the internal resistance have changed in such a way that less energy is available.

It seems impossible to avoid this deterioration altogether for the reason that a large number of ingredients are used

and in practice it is impossible to have them chemically pure; some of the ingredients contain more impurities than others, as for instance, Manganese dioxide, a natural ore, which is a commercial article with 85% MnO_2 —the remaining 15% is made up of various impurities more or less objectionable. The presence of impurities explains almost entirely why "Dry" cells are never without some degree of internal action producing harmful effects no matter how insignificant.

For a time when cells are new these harmful effects seem to be of no particular importance but as time goes on their effect becomes more apparent and finally, after a considerable period, cells when tested for available energy are found to have practically none. Some cells will deteriorate more rapidly than others and it is one of the problems of the manufacturer to reduce "shelf" action to the lowest practical minimum. Efforts along this line have met with varying degrees of success. Various expedients have been tried, the most obvious of which is to make the cells **absolutely** dry and supply moisture when they are put into service—this plan, however, has its serious drawbacks.

The question of providing a condition under which the maximum energy may be drawn from a cell is one which is not of practical interest but the question does not come up as to the number of watt-hours available under various service conditions. If the rate of discharge is too high then the cell will not have time to properly recuperate or depolarize when the open circuit interval occurs. On the other hand if the rate of discharge is too low there is a tendency for the cell to use itself up internally and thus restrict the amount available. In tests which we have made and from which this result is simply an inference it seems that if the energy is drawn out under ordinary working conditions at such a rate that the cell is exhausted in a period of about

a month the maximum energy is obtained, but if the work is such that the time during which the cell is in service is extended over a year the percentage of the maximum amount of energy available is considerably reduced. This fact is to be accounted for on the basis of the longer period during which internal chemical action producing no current is going on. It is not to be understood from this that a cell may not be depended upon for long periods of service, it simply means that a reduced watt-hour output, (which in itself may be more than sufficient for requirements) is to be expected.

In making the above statement it has been assumed that average temperature conditions prevail. It is a well known fact that there is an increase of chemical action at high temperature and a decrease at low temperatures. Since the chemical action in a cell may be considered of two kinds that is first useful action producing flow of current in the external circuit and second harmful action, which cuts down the efficiency of the cell it will be seen that the climatic condition under which the cell is stored or worked is very important. On "shelf" a cell will deteriorate slowly at low temperatures and this deterioration will increase as the temperature is increased. Cells stored in a dry atmosphere where the temperature is kept below the freezing point of water will probably show no appreciable deterioration, whereas at 100 degrees F. or above, the effect of harmful action will be noted in a comparatively short period. Hence the desirability of storing cells in cool places. Where cells are on light service requiring only a small energy drain it follows that the ratio of useless chemical action causing decrease of available energy to useful chemical action producing flow of current will be low at low temperatures and high at high temperatures. Where the rate of energy drain is high, then the temperature is not of so much importance

because the time during which harmful action can take place is greatly reduced. It would be difficult to state this as a formula but the general law is quite definite.

The internal resistance of cells does not seem to be materially affected by wide temperature variations. In one instance I have noticed an increase of less than .1 of an ohm which the temperature changed from 100° F. above zero to 25° F. below zero. This change of .1 of an ohm would cause a very large variation in the instantaneous am-meter but the ordinary 2½x6 inch size is used almost exclusively in circuits requiring less than one ampere. Where the current is only .1 of an ampere or less it will be seen that the increased resistance would absorb less than .01 of a volt. This would, of course, be insignificant in comparison to the total E. M. F.

There is a characteristic difference between "Wet" and "Dry" cells, in that the internal resistance enters as a very different factor in the two cases. The internal resistance of "Wet" cells in general is fairly constant, while that of "Dry" cells is a constantly varying quantity. When a "Dry" cell is new, its internal resistance may be approximately 1/20 of an ohm, and it increases from this up into the hundreds of ohms. The magnitude of the internal resistance of the "Dry" cell determines the age it has reached in its period of useful life.

I am showing on the chart two sets of curves which bring out very strongly this factor of internal resistance. The test conditions were the closure of the circuit at certain intervals through an external resistance for a period of time which remained constant throughout the test. In the first set there is a high rate of energy discharge and in the second a low rate. The ordinates of these curves are expressed in volts and the abscissas in time. The three curves in each set marked A, B, and C, represent respectively

the E. M. F. on open circuit, the Potential Difference at the time of closure of the circuit through an external resistance and the Potential Difference at the end of a period, which is constant throughout the test. It will be seen from these curves that at the start the Potential Difference at the beginning of closed circuit and the Potential Difference at the end of the period are practically identical. The E. M. F. curve is somewhat higher. As the cell is used, it will be noted that these curves diverge, and if carried far enough, the lowest curve would finally touch the line indicating zero P. D. The high E. M. F. on open circuit is of no particular value, because it indicates a condition where no work can be done. The instantaneous drop, when the circuit is closed shows the magnitude of the internal resistance when the current starts to flow. The difference between the potential at the beginning of the period of closed circuit and the potential at the end indicates to what extent the internal resistance increases, or the "practical polarization." These curves give a very correct idea of the characteristics of the "Dry" cell, and from them may be deduced most of the data which should lead to the proper use under service conditions.

As will be seen from the chart the available energy from a cell decreases from the start. If the drain continues long enough the zero point will ultimately be reached. There is no reason why cells should not be left in circuit as long as they contribute an E. M. F. to the current flowing, but if the potential of individual cells is allowed to drop to a very considerable extent it will be necessary to correspondingly increase the total number in series so that the required potential for working conditions may be maintained.

The determination of the point at which cells should be taken out is something that must depend on the particular service condition. If in telegraph work there is a permis-

sible variation in the current from 90 down to 60 mil-amperes the average potential per cell could drop from 1.5 volts to 1 volt. When this point is reached the entire set must be replaced unless additions are made to the series. This expedient is often adopted and works out as follows: If there are 10 cells at the start giving a potential of 15 volts (90 M. A.) then when the potential is only 10 volts (60 M. A.) the addition of 1 cell allows the average to come down to .91 volts per cell, similarly the average for 12 cells would be .833 volts, for 13 cells .769 volts, etc. Thus, cells can be run down to lower averages and more of the total energy utilized. If, however, this plan is carried too far and cells are left in circuit until they reach the zero point they become resistances which simply increase the circuit resistance as though additional lengths of wire were inserted, additional work being thrown on the remaining cells. I believe the best practice, is to set some potential difference at which the cells are to be taken out of circuit, thus preventing the number in series from becoming excessive.

I wish to call attention to the fact that if a sufficient number of cells to do the work are placed in a circuit a larger number is objectionable for the reason that too heavy a flow of current is produced. For instance, if 90 milliamperes be sufficient to operate the apparatus, then the addition of enough cells to bring the current up to 150 milliamperes would be decidedly objectionable since the flow of current in the circuit tends only to draw energy from the cells at an excessive rate. Where "Dry" cells are used in circuits of widely varying resistance this fact points to the desirability of determining the necessary E. M. F. for each circuit and connecting the proper number of cells in series to give the required flow of current.

If the circuit resistance is known a voltmeter across the

terminal of the battery will show whether or not there is sufficient E. M. F. to produce the desired flow of current, or if the resistance is not known a mil-ampmeter will serve the purpose equally well.

I have understood that in general, for telegraph and block signal work, a current of 60 to 90 mil-amperes is required. If the proper number of cells are put in circuit to produce 90 milliamperes at the start, the cells may be run down to a point where their internal resistance will be such that only 60 milliamperes will flow. It has been found by experience that where "Dry" cells are installed as a "unit," that is, a certain number in series which are all put in and taken out together, it is highly desirable to have cells uniform in quality and condition. One defective or run down cell among fresh ones will drag the others down so that the set is unfit for service before the fresh cells have given out their normal amount. The greater the degree of uniformity the more satisfactory will be results.

The use of "Dry" cells in "Multiple" is sometimes of advantage where the current drains are heavy and frequent. It may be that two sets of cells in multiple will work more than twice as long as either set by itself. A similar arrangement to meet similar conditions to connect sets so that, by means of a switch, one set is in circuit at a time, thus giving the other set or sets time to recuperate. The adoption of plans like the above must be determined by conditions.

I have mentioned the fact that after a time at average temperatures the deterioration of cells comes to be an objectionable factor, it follows from this that cells should be put into service as fresh as possible. If renewals are to be required after a certain period, it is best to get fresh cells from the maker, rather than to order a large stock and keep them on hand for use when needed. Cells may become very old, if kept in stock following this plan, and they will not

be found to be as satisfactory as the fresh ones. It is, of course, recognized that a certain number of cells must be kept in stock, but the number should be made as small as possible and they should be kept in as cool a place as is available.

Cells either in storage or service should also be protected from moisture for the reason that short circuits may occur from the cartons, or paper boxes becoming saturated and forming conducting paths between the external surfaces of adjacent cells. They should also be protected from dust and dirt, because conducting particles may form accidental short circuits. If an accidental cross occurs between leading wires, it is apparent that there will be a very heavy energy drain, sufficient perhaps to cause the wires to become red hot. A heavy drain of this kind is so much loss to the total available energy, just as much as a leak in a tank would diminish the quantity of the contained liquid. Other drains on the energy supply may be made by connecting up buzzers, bells, lamps or signals, which, of course, will tend to decrease the energy available for the circuit in which it is desired to utilize the maximum amount.

“Dry” cells are liable to damage from rough handling. The wax used for sealing if cracked or broken tends to hasten the drying out of the interior. The resistance between the zinc cup and its lining may be so increased as to become a serious defect if the cell is subjected to pounding and there is also increased harmful chemical action.

My experience with battery gages is that they are not very reliable, and that their usefulness is confined practically to detecting cells which have reached such a condition that they should no longer be left in service. In the first place, their accuracy is no greater than should be expected where the price they bring is taken into considera-

tion. Then, again, the method of making contact with cell terminals causes the readings to be very variable.

By varying the contact in applying battery gauges very wide variations in the reading may be made which of itself would be enough to make the instrument of questionable value. The position of the instrument and vibration are also factors which enter to determine the magnitude of the readings.

There is this to be said, in favor of battery gauges and that is that where a certain gauge is used by an individual exclusively; he soon gets to understand the readings and can interpret them so as to obtain the best estimate of the condition of the cell which it is possible to obtain from the reading of the instrument.

When it comes to a question of determining the relative merits of new cells the gauge is of practically no value, unless there are "defectives" which it is desired to find. The battery gauge test, however, is much to be preferred to the method sometimes used of short circuiting cells through a wire on which an ordinary compass is placed and judging their condition by the magnitude of the deflection. A test of this nature is not only a heavy drain on the cell, but the ratio between current flowing and deflection is not constant.

The best way to test cells in service is to allow the current to flow through its circuit under standard conditions and then to apply a high resistance voltmeter of good construction, noting the potential difference at the terminals of individual cells. By this method each cell will show what it is doing under regular working conditions.

For testing new cells a high resistance voltmeter is desirable to see if the E. M. F. is up to normal and the instantaneous current flowing through a low resistance ammeter will give a good indication of the internal resistance. How-

ever, it does not always follow that the cell which will give the best service has the lowest internal resistance.

The question is often asked as to the quality of new cells of various makes or of various lots of the same make as determined by instrument readings. It is impossible to answer intelligently with only such limited data to go by. The only satisfactory determination is to give cells a closely observed service test and from results form conclusions. Cells must have time to show their staying qualities and these cannot be demonstrated in a moment. It is possible to make cells that will give remarkably good initial readings, but which have no staying qualities and the reverse is also true. The best plan for the user of dry cells is to determine by service tests the make adapted to his requirements which he knows he can best depend on as being reliable in quality and in uniformity of grade.

Mr. Fry has made a valuable investigation of actual conditions found in railway telegraph and block signal work. His data shows that the average time of circuit closure is less than 5 minutes per day. This is reckoned on a basis of 10 minutes total of telegraphing per day which would mean that there would not be more than 150 communications. As the open and closed fractions are respectively 5/9 and 4/9 the total closed period will not be over 5 minutes. The requirements as to flow of current are from 60 to 90 milliamperes or say an average of 75. On this basis the watt-hours per cell per day would be expressed by—

$$.075 \times 5 / 60 \times 1.25 = .0078$$

or for 1 year

$$.0078 \times 365 = 2.847$$

on the assumption that the average voltage per cell is 1.25. Such an energy drain is very light and represents only a small portion of what would be obtained under ordinarily favorable conditions.

In the operation of telephones the conditions are more severe—it is of course necessary for current to flow during the entire time of speaking into the transmitter and through the transmitter resistance is constantly varying it cannot be said to approach open circuit as in telegraph transmission. With high resistance transmitters a minimum of 140 milliamperes is required and it may go as high as 320. With transmitters adapted for some railway work which have a lower resistance a current not less than 300 nor more than 600 milliamperes would be used—we may say roughly that 500 would be about the average working strength. I have no data as to the length of time per day during which a telephone would be used, but the magnitude of current flow and its continuity indicate the severe condition of battery drain.

With the majority of telephone equipments for train dispatching now being recommended a key is associated with the transmitter and so arranged that when the user wishes to talk to the distant party, or in other words when the transmitter is in use, the key is depressed, thus closing the battery circuit. During the period when the distant party is talking the button is released, thus opening the local transmitter circuit and saving the cells from a current drain during the time it is not required. A device of this kind is also of benefit from a transmission standpoint for the reason that if the cells are given intermittent service during conversation they will have a chance to recover, during the intervals of open circuit and will maintain a more nearly constant voltage on the transmitter.

I am indebted to Mr. Fry for a circuit diagram showing a very ingenious arrangement of “Dry” cells used with a telegraph repeater. The arrangement is such that the current requirement of the “Dry” cell is reduced to a minimum and the current energy is used to the best advan-

tage. From the diagram it will be seen that only the set of "Dry" cells on the receiving side is in service and that here the current flows only during the "space" or "open" period of the sending line. As the sending and receiving functions are alternated it will readily be understood from the diagram how the two sets of cells are alternately brought into action thus carrying the reduction of closed circuit periods to its limit.

The numerous advantages of the dry cell for open circuit work are now being appreciated. The wet cell formerly used in telephone service has disappeared and with its exit has gone a source of annoyance and expense. The possibility of having a certain quantity of electrical energy in a form requiring no attention for maintenance, giving out its energy as demanded and so cheap that it may be thrown away when no longer useful is almost ideal. As time goes on the field of application will constantly widen until all requirements for a small amount of electrical energy used intermittently over a long period will be taken care of by the "Dry" cell.

President: Gentlemen, this is a very interesting paper on a subject that all of us are very concerned in, much more so now than we were two or three years ago. We have had several papers on dry batteries in the past from Mr. Fry, and I think the Topic Committee very wisely selected him to lead the discussion on this paper. We will be very glad to hear from Mr. Fry.

Mr. Fry: Mr. President and gentlemen: It will not be possible for me to add anything to the paper which has just been read, and I wish to refer only to the two principal items, one about the key which Mr. Loveridge suggests is being used by a number in a primary circuit. We are adopting it for general use now in all our telephone train despatching and other telephone railroad service. It

is just as easy for an operator to press a key while he is talking as it is to work his telegraph key when he is sending. The objection to that is eliminated. His reference to that repeater; with reference to that, I intended to have brought some blue prints for this diagram with me, unfortunately I forgot. If any one wishes a copy of the diagram before the minutes are printed, I will be glad to send it to him.

Without intending to detract from the value of that paper, I want to give a little more information on the use of the dry battery. A little card I find here gives me what I wish to say; I will read a portion of it.

We equipped 400 miles of road with 1,200 cells of dry battery, at 16 cents each, costing \$192. If the same number of miles had been equipped with gravity battery it would have cost \$400 for additional equipment, and at the present time, after two years maintenance, would have cost \$1,600; or, if there had been required 800 cells for 400 miles of road, at \$100 per mile it would have cost \$1,400. It has cost \$192, the original cost and maintenance for two years, \$1,400,—\$700 a year, or approximately \$150.75 per mile per annum for maintenance.

When we first concluded to find out something about the use of the dry battery, we were not thoroughly posted. The paper he has given us today will serve to give us all more of an idea of its workings, and we sought simply to try some experiments with the view of determining to some extent the life of a dry battery. As we understood it before, we estimated that a dry battery used in connection with a lot of wire, if it lasted nine months would be beneficial. It lasted three years. I find that there is coming before us at all times something new, some new avenue for the use of the dry battery.

In connection with the automatic repeater, which I wish to say is a success, it is always prompt, always on tap and can be set quickly, in any place, and it will work at terminals or at cross lines. Yesterday I discovered a new type of automatic repeater, which I saw on exhibition here. That repeater in its original state was intended to work at terminals. The young man who presents it has arranged it so that it will work at cross lines or at the junction of a branch of main line. I suggested to him that the introduction of a dry battery in place of another battery would operate it successfully; so his automatic repeater, which appears to me to be all right, will work successfully by the use of a dry battery as well as any other.

There is nothing else, Mr. President, I can say on this subject; I would rather leave the matter as it stands now for discussion of the paper.

President: Gentlemen: The Topic Committee has selected Mr. Walstrum to continue the discussion, but he is not present, and it is now open for general discussion.

Mr. Ryder: There is one point in connection with the use of the dry battery, and particularly its extensive use in train despatch work, that is decidedly interesting, and one on which there does not seem to be a very great deal of knowledge, and I am going to ask Mr. Loveridge, or any one else present, if they can enlighten us on that point. Recognizing the fact that it was going to be something of a problem to maintain so many cells, distributed over the section of line necessary on a train or other similar circuit, it occurred to me that the use of a larger cell would be economical. Now we have been making some use of the larger cell. I do not believe that our use could be dignified by the term "experiment;" we have not watched it close enough for that designation, but such information has come

to us as would indicate that the expected increased length of life of the larger cell did not equal the increased cost, and I would like to know whether it is reasonable for us to expect that condition.

Mr. Loveridge: I cannot make any very definite statements as to whether or not the large cell could be advantageously employed. The large cell has the characteristic of furnishing a larger amount of energy than is to be obtained from the small cell. Now if the energy drain is going to be so great that it requires the large cell to meet it, it is possible that it would be more profitably employed than the small cell; if the small cell meets the requirements of the energy drain, then there is no use putting in a big cell. That is a question that would depend upon the actual conditions under which you intended to use the dry cell, a question to be determined on the rate of energy drain. The ordinary small dry cell, a $2\frac{1}{2} \times 6$ inch size, is capable of giving out about, we will say, 20 Watt hours. Now in the illustration I used where about 2.85 Watt hours were used in a year, it is seen from that that there would be no necessity of putting in the large cell, but if there were conditions requiring a much more heavy drain, perhaps a large cell would be desirable.

Mr. Ryder: You realize that there is another factor that enters into this proposition, and that is the labor and expense of renewal, and I realize that probably the best we can do is to hazard a guess at the proposition at the present time. I was in hopes that somebody was a better guesser than I am.

President: I might say, gentlemen, that in our equipment we use the small cell. The equipment requires only one cell for a speaking transmission, but in order to provide for a longer life and greater storage we put three cells

in multiple. Some of these cells that were installed last June have just finished their work; some became defective in about three or four months. The experience showed that there was a great variation in the work given out by the cell. I might say that this circuit is a very busy one. They have handled, during an eight hour drag, as high as 87 orders, I think it was, and during the 24 hours for the three drags we have had over 201 orders for the 24 hours. That covered, of course, a considerable period, of the day when there was practically no work at all on the line. A good average of practically $10\frac{1}{2}$ orders per hour, I think, is pretty frequent use of the telephone equipment, and for cells to stand up under that work at points where considerable of the work was done, for one year, shows up very favorably in use of the dry battery.

Mr. Ryder: I would like to ask Mr. Loveridge if he can give us the capacity of the larger type of cell known as No. $10\frac{1}{2}$.

Mr. Loveridge: I cannot give that definitely without knowing the definite conditions. It requires a definite working condition to be able to judge. The energy of the large cell is about twice that of the small cell. It would be a 40 Watt hour. The cost of the large cell is about three times the cost of the small cell, and you can make three renewals of the small dry cells in place of one large. The cost of replacing cells is sometimes a bigger factor than the cost of the cells themselves. If you have to involve the expense of several dollars to replace 50 cents worth of dry cells, it does not make much difference what you put in, and a large cell, would, of course, be cheaper under such conditions. but these are all conditions that must be considered in relation to the use that you are contemplating making of the dry cell.

President: The condition I mentioned of my knowledge, was three cells in multiple, how does that compare with using the one larger cell?

Mr. Loveridge: That would give practically the same amount of energy.

Mr. Green: I would ask whether two No. 6 would not accomplish the same result, or at least furnish the same quantity and at considerably less expense.

Mr. Loveridge: They would probably furnish a greater amount of energy at small cost.

Mr. Groce: I would like to ask if any of the members have noticed any depreciation in the quality of dry cells that have been secured within the past year. I noticed our Purchasing Agent has been securing bids as low as $11\frac{1}{2}$ cents on a small cell where we paid about 16 or 17 cents a year ago, and this covers these different makes of small cells.

About five years ago we installed about 175 block offices where we had control blocks operated by a battery at each station, and on an initial installation we used on two districts potash cells on some districts and some of the districts we used dry cells, averaging about two minutes service a day. We have a district calling service at the present time that, as near as I can figure, we are using about eight minutes per day, and I therefore figure that we should expect from the dry cells about 25% of the life that we did under the block service, which was equal for a six months service on dry cells. As a matter of fact, we get less than three months service before they gave out, and unless we robbed all the manufacturers of all the old stuff they have had on their shelves for two or three years, there must be some change in the quality of the cells. Our current conditions were the same. The line is longer, but the quantity is the same.

Mr. Loveridge: Where dry cells are used there is no way of telling when the lines have run down, and it is quite possible that there may be some condition that is not recognized that will drain energy at a rate greater than it would seem that it is taking. The cell will give up its energy whenever it has any chance to do so, and when it gives it up it is gone, so that external conditions, like an extra short circuit, or things of that kind, or perhaps an accidental closure of the path through a decreased resistance will make an energy drain that is not taken into consideration. You have to take into consideration every drain on the cell.

Mr. Groce: We had both experiences, though, isolating them.

President: Mr. Davis, have you anything to offer?

Mr. Davis: Mr. Chairman, I would like to talk a long time about the dry battery proposition, as we are all interested in it. However, we are short of time at these meetings. I hope some day we will come and not have to hurry.

Inasmuch as the gentlemen who have written the other papers on our programme are not present, much as I dislike to do it, I will move that the papers be printed in accordance with the copies of them that we have, and that the reading of them be dispensed with, on account of the limited amount of time that we have to work.

(The above motion, being duly seconded by Mr. Griffith, was carried.)

STANDARDIZED EQUIPMENT.

By E. J. Little.

Supt. Telegraph, Great Northern Ry.

I am at a loss to understand why the Topic Committee should have selected us as the victim in connection with this subject, unless, peradventure, they were cognizant of

one of our past sins, which was the habit of purchasing telephone equipment more for its good looks and cheapness than for its good qualities.

No doubt many of us have been too prone to purchase various types of instruments in the past twelve or fifteen years from the numerous manufacturers, large and small, simply because it had some small improvement over that of some other make which we had previously purchased. The result has been that our lines are equipped with a conglomeration of "devices", added from time to time as our system grew and additional facilities were necessary.

This has been the cause of complaints and criticism from other Departments, to say nothing of the troubles of our linemen in endeavoring to keep the lines in working condition.

An inspection of our telephone lines a few years ago developed the fact that four or five different types of instruments had been installed on some of them; a few Viaduct, a Victor, a Standard, an Erickson and perchance a Stromberg-Carlson or a Kellogg. None of the parts of one would fit the same part of another, and as the Division Lineman was unable, in a great many instances, to make repairs, not having the necessary material on hand, the defective instruments were shipped in and new ones ordered to replace them. In a great many cases the defective instrument was placed in the scrap heap as the cost of new parts, with express charges, would not justify us in making repairs. Had our equipment been all of the same kind or rather, had we adopted a standard there would have been little or no loss, as the parts of the instruments that were not defective could have been utilized in making repairs. This is one very good reason why we should standardize our equipment.

I presume many of you have had somewhat similar experience and, no doubt, you will agree with me that the question of standardizing equipment is one worthy of close study and consideration not only in the Telegraph Department, but in all other Departments of a railroad as well.

More especially is this true of the Telegraph Department now that the telephone is displacing, to a considerable extent, the telegraph equipment both for train dispatching purposes and for the handling of commercial and railroad telegrams.

Unlike the common Morse instruments used for single transmission, the telephone and the various selective devices now on the market are of more or less intricate construction, requiring much more intelligent supervision than the telegraph or the ordinary telephone, and when we consider the fact that this equipment will, to a certain extent, be placed in charge of the ordinary telegraph repairmen who have had little or no experience in the maintenance thereof, the importance of having the least variety of these devices cannot be over estimated.

Where our equipment is standardized, it will be a very easy proposition to educate these men in the installation and maintenance of the apparatus, enabling us to materially reduce the cost of operation, as it will avoid the necessity of employing a force of skilled telephone men, not only to install, but to make ordinary repairs and remove trouble.

It can be readily seen that if your equipment is not standardized and your line is equipped with a variety of selective and telephone apparatus, all having a different method of wiring, adjustment, etc., the matter of educating your Division line repairmen is going to be a very difficult one.

This is more especially true where we are continually

making changes in our repair forces, which makes it necessary to educate new men at frequent intervals.

After a few practical demonstrations the average lineman is generally able to absorb the information imparted to him as to the manner of installing, testing out and locating defects, adjusting and cleaning the various contacts, and where your equipment is all of the same pattern, wiring, etc., identical in all offices, this means not only the prompt removal of trouble and restoration of your service, but also economy in operation of your train service, and as stated before, obviates the necessity of maintaining a force of skilled electricians as repairmen.

While I recognize the fact that in the present state of evolution of the selective signalling devices, it may not be practicable or desirable to standardize this part of your equipment, I am of the opinion that we should standardize the other portion of the apparatus, i. e., the telephone transmitter, receiver and all other apparatus that is not part of the selective signalling device.

In addition to the question of the labor cost of maintenance, is the one of the cost of material which is necessary to keep in stock at various points on the line to replace defective parts of the telephone equipment.

Although the greatest of care may be exercised in the manufacture, and the closest inspection by skilled mechanics and electricians made, of the apparatus before shipment, defects are liable to develop from time to time; damage may be caused by careless handling or maliciousness on part of employes; lightning may burn out or practically destroy certain parts; or, which frequently occurs, the damage may have been occasioned in transit from the factory to point of destination.

The amount of such stock, material or parts will depend

on the number of stations equipped. If your equipment is not standardized, it can be readily seen that a large variety of material will have to be purchased for the purpose mentioned above. This not only means considerable money tied up, but is very liable to cause confusion and delay in shipping out replacements, through misunderstanding on part of shipping clerk as to just what make or style of apparatus the parts ordered are intended for.

So far as our system is concerned the Managers of our Relay Offices will have charge of the telephone train dispatching circuits; will keep the necessary stock on hand to replace defective parts and will furnish such parts to Division Linemen from time to time, when called for.

In regard to standard equipment for our telegraph service, fortunately (or possibly unfortunately) the Telegraph Company furnishes all of our equipment for telegraph wires and we are generally compelled to take whatever they decide to furnish.

We have however, adopted a standard arrangement for installing the switchboards in our larger terminal stations where brick or stone is used in construction. Our wires are conducted into the building in loricated pipe, placed in an eight inch tile conduit. A recess 3x3 inches, 6 inches deep, is provided in a convenient location inside the office, from which conduits lead to the basement and to the instrument table. An adjustable steel frame is provided to which the switchboard is attached, and that part of the face of the recess not taken up by the switchboard is filled with oak panelling.

The adjustable steel frame is hinged to one side of the steel frame of the recess, so as to permit of the inspection of wires. The cable leading from the pole line is connected to a distributing board and the wires conducted from the

distributing board to switchboard binding post with flexible wire spiraled.

Blueprint of the steel frame and recess attached.

CENSORSHIP OF RAILROAD TELEGRAMS.

By J. G. Jennings.

Sup't Telegraph, Rock Island Lines.

When I was requested by the Chairman of the Committee on Topics to prepare a paper on "The Necessity of Censoring Railroad Telegrams" it seemed to me, at first thought, so much had been said and written on this subject that it could no longer be treated as a matter for interesting consideration by our members. On second thought, however, I realized that while it may be an old subject it should always be a new and very live one to keep before us at all times. Therefore, I will begin by saying that there are a great many angles in the censorship business to be considered before undertaking it:

First: You must have the active support of your superior officer. Without this very essential aid a censorship system may as well not be started.

Second: Once started, never let up. If you do, the usual mass of useless and unnecessary stuff, some of which would answer every purpose if sent by train mail, will be offered again within a very short time for transmission by wire.

All Telegraph Superintendents must realize how difficult it would be to organize and maintain a perfect censorship system unless the principal relay offices are under the direct jurisdiction of the Telegraph Department. For instance, take an office where the Division Superintendent, Trainmaster, Chief Dispatcher and other Division Officials are located—the operators reporting direct to the Chief

Dispatcher. If the operators at such a point are wise (and they generally are) they would hesitate a long time before sending in a single message, even though they see at a glance that the message could be handled as a mailgram without detriment to the business. On the other hand, if the Manager at that office reports to the Superintendent of Telegraph he is, in a great measure, free from the petty persecutions operators reporting to the Chief Dispatcher would be subjected to, if he endeavored to carry out a general order to forward all messages to the Superintendent of Telegraph (after being sent over the wire), which, in his judgment, could have gone by train mail without detriment to the Company's interests.

On the Rock Island Lines we have Managers at practically all of the General Superintendents' and Division Superintendents' headquarters, reporting direct to the head of the Telegraph Department; and we can keep a pretty accurate check on every message handled on the wires, both through and local.

These Managers have instructions to go through their files daily, pick out all telegrams which appear to be unnecessary to be transmitted by wire, and forward them to the Superintendent of Telegraph. We do, of course, depend in a way upon the Managers to properly censor all business handled at their offices, but not entirely so. Every time one of the Telegraph Department Staff is at any of our relay offices he considers it a part of his inspection trip to go through the back files, picking out several days' business at random and see whether or not the Managers are following instructions. We have, at times, found cases where a Manager may, through a personal friendly feeling towards a Division Official, suffer from defective eye-sight in sorting out telegrams when he scans those sent by that particular friend of his; but when he knows that one of my assistants

or myself are liable to drop in any time to check him up he is pretty apt to keep his eye-sight up to standard at all times.

This censorship system is something we watch very closely on the Rock Island, and if we do not receive a bunch of telegrams from each one of our Managers at certain intervals we find out the reason.

When these messages are received in my office one of my assistants goes through them carefully, and if in his judgment any of them will pass muster as telegrams they are returned to the Manager. The others are sorted and one of our blank forms bearing the fac-simile signature of the General Manager or Second Vice-President is filled out, affixed to the telegrams in question, and forwarded to the sender for explanation. The blank signed by the General Manager for offenders in the Operating Department and by the Second Vice-President for the Traffic and other Departments. These forms are numbered and written up in duplicate, the original being mailed direct to the official concerned with the telegrams in question, the duplicate being retained in my office; and if, after a reasonable time, the original is not returned we send an urger for it, signed by the General Manager or the Second Vice-President. Previous to adopting this plan all officials and representatives were notified by the heads of their respective Departments to curtail their telegraphing over Railroad wires to the minimum, as in a way it costs just as much to send messages via Railroad wires as it did via the wires of the Commercial Telegraph Companies. The circular letters were worded in such a manner as to leave no doubt upon the minds of those who received them as to the meaning of those instructions, and we immediately experienced a decided slump in the total number of telegrams handled. It was not long, however, before the unnecessary matter filed com-

menced to increase, and we then went after the offenders with the forms referred to, with the most gratifying results.

General Superintendents, Division Superintendents and others in the Operating Department, know if they file a message for transmission that does not pass inspection an explanation for violating previous instructions will be demanded by the General Manager. The same also applies to violations by representatives in the Traffic Department, explanations for which must be made to the Second Vice-President. They also know, by past experience, that it is not an easy matter to "hoodwink" these officials into accepting a perfunctory reply, as they often require a detailed explanation of the whole transaction leading up to the sending of certain telegrams, and they have found it is not an easy matter to satisfy the General Manager and Second Vice-President, as they have to be shown; and having this in mind, almost without exception, all of our officials, when the possible necessity of sending a message occurs to them, weigh the question very carefully before deciding to file it for wire transmission.

We do not stop on the censoring of telegrams alone, but we censor even legitimate telegrams as to the number of words contained therein. In the adoption of this practice we have saved thousands of unnecessary words being transmitted and the great money maker, Time, which is applied to other important telegrams, making the service highly efficient. In other words, we endeavor to impress upon the mind of the maker of the telegram that it is purely a business proposition, and that it is unnecessary to display any Chesterfield characteristics whatever in its make-up; the words "please", "kindly", etc., as well as the "two" and "three" letter words are eliminated and the telegram, when filed, is in as few words as is practical to the full understanding of the receiver.

We have three grades of telegrams, namely, Pink, Rush and Ordinary, and the operators are expected, and it is their duty, to scan their files and see that the "Rush" telegrams do not get buried under the Ordinary, or take their turn telegrams.

The "Pink" telegram privilege is confined to the General Superintendents and higher officials only, and this high class business is not permitted to even see a "hook", as it is handed direct to the operator on the wire it belongs and takes preference over other telegrams, and no excuse, other than wire failure, will be accepted for delay in transmission. This being true, we can handle a "Pink" telegram from the General Office in Chicago to any General Superintendent on the Great Rock Island Lines within a space of five minutes, one of whom being located in Fort Worth, Texas.

In the wind-up will say, we all know "Information is the life of Transportation", and on a big system like the Rock Island, with its five trunk lines, composed of magnificent distances, it is highly essential that good prompt telegraph service be maintained, and it can be accomplished by keeping Mailgrams, as it were, that are filed as telegrams, down to the minimum at all times, and censorship is the secret of such service.

DISCUSSION OF MR. JENNING'S PAPER ON "CENSORSHIP OF RAILROAD TELEGRAMS."

By F. E. Bentley, Supt. Telegraph, Terminal Railroad
Association of St. Louis, Mo.

Mr. Jennings has covered the subject completely and there is little to add, excepting that, in my opinion, the censorship should commence before the message reaches the telegraph office, and that the constant supervision neces-

sary to censor those messages which do pass the outposts might be made more automatic and effective.

At some offices where many telegrams are originated, young clerks have about the same mystic hunch to try their hand at writing telegrams as the average embryo operator feels in showing his ability to send them, and the lengthier the message the more pleasing the past-time, neither the clerk nor operator being competent to realize the importance of briefness or to recognize mailgram matter.

The support of the superior officer which Mr. Jennings denotes as the first essential aid would, therefore, better start at such offices by having someone delegated who is interested in curtailing the expense and can see an item of cost beyond his own department, to pass on every telegram written by clerks in his charge. This should be the chief clerk or his first assistant. The influence created by this plan would result in greater care on the part of the clerks to avoid mistakes that might need the telegraph to correct, and at the same time restrict the use of the telegraph to only that business which demands immediate attention and cannot as well be handled by mail or telephone. A censor of this character could by hints and precepts show how telegrams may be abbreviated into the smallest possible number of words. This latter feature (so closely held in mind by writers of commercial messages for which they pay according to the count of words) is little thought of by originators of railroad messages.

The superior officer might help much more, especially in cities where good telephone service is maintained, by instructing all concerned that the telephone should be used for city messages where quick communication is desired and that a record may be as well made of a telephone message as of a telegram.

It is said that the late Dr. Edward Everett Hale had a set of rules which he believed every writer should follow:

1. Know what you want to say.
2. Say it.
3. Use your own language.
4. Leave out the fine passages.
5. A short word is better than a long one.
6. The fewer words, other things being equal, the better.
7. Cut it to pieces.

These same rules could well be applied by writers of telegrams and this one might be added: "When starting to write a telegram, cut it out altogether, if possible, and use the mail service or the telephone."

President: This completes the reading of the papers. I hoped that my successor would take care of a small matter, but it is approaching the noon hour and I want to give a chance for the committee I propose appointing to get together, so think it would be best to name the committee now, that is, the committee on resolutions of thanks to the Western Union and Postal Telegraph Companies, and others, including our Entertainment Committee, resolutions of thanks to those for their benefits received during this session. I will ask to serve on that committee:

Mr. Ryder,

Mr. Chenery,

Mr. Griffith.

If these gentlemen will kindly consent and bring in resolutions for approval this afternoon, we would be very much pleased.

Now, gentlemen, having completed the reading of papers

leaves the order open for new business. Is there any new business to be brought before the meeting?

Secretary: I move that we adjourn to meet at 1:15. (The above motion, duly seconded by Mr. Davis, was carried.)

(Adjournment.)

FIFTH SESSION.

The meeting was called to order at 1:20 P. M., Thursday, President Camp in the chair.

President: We are under the head of new business. Coming under that head we will have to take up the place of next meeting, as there is no provision made, and, as you are all aware, we decided to reconvene so as to hold a special session at 1:30, while waiting for 1:30, so as to give every one a chance to be here, if any member present has anything to offer under the head of new business, please bring it forward now.

MEMORIAL.

President: Gentlemen, the hour of 1:30 has arrived. In view of the fact that the funeral of the late Mr. Millington takes place at 2:30, Eastern time, and is now supposed to be in progress, we will take up the remarks on Mr. Millington first. I hardly know who to call on who has been his most most intimate friends in this Association; maybe some of you gentlemen who are better acquainted can suggest one of the members. Mr. Kinsman, would you make some remarks regarding Mr. Millington?

Mr. Kinsman: It has not been my good fortune to be intimately acquainted with Mr. Millington, but I have had some business relations with Mr. Millington of the most pleasant sort, and have always found him to be not only a gentleman, a man of the greatest refinement and of strong character and of ability in his profession, but a man of the tenderest sympathy as well, a man who in his family relation seemed to meet every requirement of the true and refined gentleman. As I say, it was not my happiness to have known him as intimately as I would like, but I have felt very deeply his sudden taking away and I do wish that I might be able to express to the members of this Association and our guests what my real feeling is and what the loss is to this Association, of which he was a most active and able member. I know there are many others here who have the ability and the happy honor of speaking about this before you in a much more comprehensive and feeling way than I am able

to, and I would like to hear some remarks from Mr. Selden.

Mr. Selden: Mr. President: I was not fortunate in knowing Mr. Millington, you might say, at all. I met him but twice in my life, but what Mr. Kinsman has said about him meets exactly what my views were in reference to him. He was genial and gentlemanly in every way, and was an ever hard worker. He was very much interested in the Association and in everything that he could do to contribute to its success. I am sorry we were not thrust together more because even in my brief acquaintance I received considerable good from his companionship.

President: Are there any other members present of the committee on which he was? Mr. Davis.

Mr. Davis: Mr. President: I was in the St. George Hotel at Evansville, Indiana, about four years ago and I accidentally met a gentleman whose name I have forgotten, but he told me that his home was in Detroit. When he learned that I was a Superintendent of Telegraph he asked me if I had ever met Mr. E. H. Millington, of the Michigan Central. At that time I had not met Mr. Millington, and when I told him so, his reply was, "You ought to." His remarks concerning Mr. Millington at that time were as complimentary as I have ever heard of any man. Later I had the pleasure of meeting the gentleman, and probably we have met twice a year since then. At every meeting I have found something in Mr. Millington to substantiate the statement made by his friend, whom I met in Evansville, and I think that every member of this Association today holds in very high esteem

the memory of a man whom we can rightly consider one of our best and most substantial friends and members.

Mr. Kinsman: Mr. President: We have Mr. Francis here, of the telephone company, and I think he has had some business relations with Mr. Millington, and perhaps can speak a few words of interest.

Mr. Francis: I have known Mr. Millington for several years, and I have always found him a perfect gentleman in every one of our dealings, and everybody else that I ever heard speak of Mr. Millington has spoken in these same terms. He was a man who was always after the best interests, seeking knowledge from the others. Our dealings were always pleasant, and I was always glad to see him. Whenever he came to Chicago he always made an effort to hunt me up, and we spent many pleasant hours together.

Secretary Drew: I met Mr. Millington more frequently since he was appointed Chairman of the Committee of Arrangements than I had heretofore, although I had met him several times at our various meetings, and the interest he took in these meetings of the Association was something that was very marked. He came to Chicago several times just to talk about it. He was so desirous that everything should be done that could possibly be done, and he began so early in the year. Finally one time I said to him: "Why, Mr. Millington, you have got lots of time; don't be in a hurry, you can have plenty of time to make your arrangements." But wasn't it fortunate that anxiety of his to have the thing done was carried out so completely that, when he was taken sick and was removed

from his active field, practically everything had been done except the little details that were arranged afterwards by the other members of the committee. When he went from Detroit to St. Thomas on account of his ill health, he wrote me a letter on the train in which he said that he hoped he would soon be able to take up the work again, but that he was obliged to go away for a rest and change on account of his illness. "But," he said, "I have done everything that could be done to arrange up to this time for all of the arrangements necessary for the meeting of the Association, and I hope," he said, "that everything will go on all right." Knowing how a thing like that sometimes weighs on a man's mind, I immediately wrote him a letter and told him not to give himself a minute's anxiety about the arrangements for this meeting; that he had so thoroughly planned it and had done it so far ahead of time that everything was done that could have been done up to that time, and that he was not to give himself any care about that at all, that everything here would go along all right, and that we thanked him for what he had done up to that time. That, of course, was the last that we heard of our dear friend. He was so quiet and so reticent that he was perhaps a little hard to get acquainted with, but after you got acquainted with the man you could but admire him for his many solid qualities and his high principles. We will miss him very much in this Association.

Mr. Griffith: It is difficult, Mr. President, for any of us to express our true feelings at this time. We have been associated with Mr. Millington through

this organization for many years, and we have had the pleasure of meeting him many times. It was my pleasure to be in this city some six weeks ago and I called, of course, at Mr. Millington's office to pay my respects, and I was grieved to learn from his Chief Clerk that Mr. Millington was in St. Thomas and somewhat incapacitated, and I learned at that visit, too, that notwithstanding the illness of the man, that he still held on with that persistency which has characterized all his life, in an effort to keep up the strings which he held. I was so much interested in that matter that I talked with several of the Michigan Central official of the town, and they told me that Mr. Millington had to be driven from his office, that they had to take him away against his own will in order to give him the rest that his physical body required. I mention this to further confirm the belief of the knowledge that all have of the man, that in any of his undertakings he was so thorough that his own discomfort or his own ability was a second consideration, and I believe when we find a character of that kind it appeals to us very strongly. True, it is a principle that pervades everywhere in the railroad service; it is a thought and a character that is endued in all of us, but here is a man who stood out particularly in that line, and he set for the younger element an example that I hope will be followed in their career.

Mr. Chenery: I only wish, Mr. President, that it were possible for me to put in words the feeling of respect and admiration I hold for Mr. Millington. I have had no direct business connection with him except through the Association, and I do not remember

at this time that Mr. Millington ever stayed away from a called meeting of the Western division, and I know at every meeting he lent his aid to making it a success. The last time we were together was at the St. Louis meeting in February, when he showed a great interest in the subject and before that meeting he remained over and contributed to the success of the railway demonstrating where train despatching by telephone was held. In any dealings with Mr. Millington I have always sized him up as an example that we should all try and follow. I have expressed my thoughts in this way of him: That he was what we term a thorough Christian gentleman, although I know nothing of his home life or his church connections. I sometimes wonder if a great many of us railroad men give as much thought to the inevitable as we should, but it is brought home to us very forcibly by the death of Mr. Millington on the eve of this approaching annual meeting. I do not believe that any one could leave the Association with more sorrowing friends than Mr. Millington.

Mr. Ashald: To show in just a feeble way how Mr. Millington stood with his own management, I would like to state that when I answered his call for a meeting of the Entertainment Committee, I was met by Mr. Hall, the Assistant General Passenger Agent of the Michigan Central, who told me of Mr. Millington's inability to be present and take charge as Chairman, and also said that the Passenger Department was instructed by the General Manager to take up this work of Mr. Millington's and to carry it to its ultimate conclusion in the best possible manner that

they could,—that is, to carry out the work that he was to do as nearly as possible in the manner that he would have done it. He also stated, as has been announced by some one else here, that they actually had to drive Mr. Millington away from his office, and that he was personally instructed by the General Manager to see that Mr. Millington was kept away from his work, and that he be made to forget all about his duties, and that he was instructed to say to him that his work would be taken care of, and that he was to give himself no concern whatever about the work; whether he was away one week, one month or one year—it was all right; that they were to impress that fact upon him, and that shows how he stood with his management.

Mr. Taskar: Although Mr. Millington and I lived here in Detroit, and within three blocks of each other, we have only met about three times, and there has been times that I tried to get hold of him and he would be busy somewhere, and he was a man who was always busy most of his time. He has been over to our office on more than one occasion that we had a little visit there, and he wanted me to come down and see how his train despatching apparatus was working, and I have often heard from the Michigan Central officials, with some of whom I am acquainted, and they all spoke very highly of Mr. Millington. I was not very much acquainted with him, but I think that he was a good man and he had the interest of his work at heart.

President Camp: I might say that I have met Mr. Millington on a few occasions outside of the meetings of this Association, at the Canadian Railway Commission, and on those occasions he showed the same thor-

ough knowledge of the subject under consideration as he has at the meetings of our Association. I have had no occasion to meet him outside of these few times, but from what I saw of him then I came to the conclusion that he is a very square, hard-working man.

Mr. Taltavall: I simply wish to add my sorrow to what has been already said in regard to Mr. Millington. I knew, as Mr. Drew has stated, that his heart was in this meeting. He wrote me on several occasions stating that he wanted us to co-operate with him so that there would be a large attendance at the Detroit meeting, so that he could show as much hospitality to those who attended as was possible, and even up to two weeks ago I received a letter from him, through his Chief Clerk; he dictated it at his home in St. Thomas, stating that he would be on hand to greet the members. He says: "I am under the weather now, but," he says, "I will surely be in Detroit to grasp you by the hand and welcome you there." His Chief Clerk then wrote me a few days later and said: "We have just discovered that he has suffered a paralytic stroke and it was not, as it was at first supposed to be, just simply a nervous condition," and he suffered a second paralytic stroke and then we knew that his end was near. He wrote that he was low and was gradually sinking, and I thought from the way he wrote me that he would die some time last week, so he held on about as long as any one could under such a condition. I can testify that he was, as some have said, a "gentleman," and that covers everything.

President: Gentlemen: We will now take up the discussion of the late Mr. Harry Hope. I would ask Mr. Boyce if he will kindly make some remarks.

Mr. Boyce: Mr. President: It was my privilege to be associated with Mr. Hope for over twenty-two years. He was my superior officer. He was also my friend. I learned to know and enjoy his many lovable qualities which you gentlemen all know so well. I need not recount his labors in and for this Association; they are spread upon your records which attest his tireless efforts and unflagging zeal.

He enjoyed the confidence of men prominent throughout the country and of the officers and employes of the Company he served so long and so well.

He was a devoted husband, an affectionate father, a helpful brother and a generous friend.

His chief characteristic was a sincere solicitude for the welfare and happiness of others in all walks of life.

I pay this passing tribute to his worth, to his pleasing personality and to his reputation as a man.

The Association has lost a valued member. Each of us has lost a dear friend.

Mr. Groce: In referring to our lamented member Mr. Hope, I feel that I would like to call the attention of the different members to the fact that Mr. Hope was one of the pioneers of signaling and of protection of the human lives of this country, and I hardly think that it is appreciated by even the members of this society what Mr. Hope did in the early days in that magnificent work. I can recall that as a Train Dispatcher many years ago, when signaling was first introduced and became talked about to any great extent, that the ordinary train dispatcher considered it some-

thing that would delay trains, and they were opposed to it. Mr. Hope stood out almost alone in favor of signalling, and outside of the Pennsylvania Railroad in the East Mr. Hope's name is signed to, I think, the first book of rules for block signaling of any railroad in the country. I think that as a pioneer he should be looked up to by everybody in the United States. His personal work, of course, is well known to every member. He was in the front in all moves and his kindly nature needs no comment from me.

Mr. Griffith: Mr. President: The name of Harry Hope will live long in this Association. It is symbolic of all that is kind, all that is gentle and all that is true. We have seen it in our Associations with him, and I have one particular instance that I would like to recall wherein a stranger went into his field and he met him with the usual kind heart. Harry Hope was an excellent executive and a good telegraph man in every respect, but he never lost sight of the fact that all men were human, and when last February, as we all know, and January, our lines were prostrated by the storms, I was asked to send a few of my gangs of repairers into Mr. Hope's territory to help recover. When the foreman of these gangs returned they said, "Mr. Griffith, Mr. Hope is the whitest man we ever met."

Secretary Drew: When Mr. Hope was President of the Association I was very much impressed with his efforts in regard to the increasing of the membership of the Association. He was very anxious that the Association should take a step forward during his administration, so one time when I was in St. Paul he

called me into his office and we had a long session and we prepared a letter to every general manager of all the railroads in the United States that did not have a membership in this Association, and he wrote each one of those, not a printed letter, but a personal communication, touching upon the advantages of the Association and how desirous he was that they should be represented, and that effort resulted in bringing in quite a few roads who had never affiliated with us, and it was largely, of course, because everybody knew Harry Hope.

His work, as Mr. Groce has said, in regard to the signaling features, had made him well known among all of even the general managers of the United States, and so, during that period while he was President, he was working incessantly for the good of this Association: and since then, when we had the division meeting at St. Paul, which up to that time was the largest one that we had ever held, he was very active in providing everything possible for that meeting. And we who were there all know how successful he was in having that naturally so that it would reach the greatest good for the greatest number. As has been said by Mr. Boyce, he was a pattern as a man of his family. When we went to the funeral we saw his mother, we saw his sister, and we saw his daughter, all of whom lived in his home. His wife had died some years before, but I thought when I looked at those three women, "What a loss to them!" If he was a loss to us in our activities and in our Association and in our business world, what a loss he must have been to that family of the three generations. The people in St.

Paul showed their appreciation of Mr. Hope by the large number of representative men of that city that were present at the funeral and the large floral memorials that were there representing the various societies and businesses that he was connected with. We will miss Mr. Hope very much in this Association, for he was a strong member of it, and did a great deal for its advancement.

Mr. Cellar: I feel very deeply in regard to the passing away of a man who was friend of all of us. I think I have never known a more personally lovable character than Harry Hope. I am sure that we have all lost a good friend, and the Association one of its members who spent time and energy in the advancement of the Association's interest second to none.

I want to add a remark about Mr. Millington, whom I feel we all miss equally, a man who was a sincere friend and a true Christian and whose work for the Association was in the first rank always. I was very deeply grieved over the news of the death of these men.

Mr. Taltavall: I would only add my appreciation of his mental worth. Harry Hope was a lovable character, there is no doubt about that. He endeared himself to all, and as evidence of his ability we must remember that he was not only President of this Association, but he also was President of the Signal Association, at one time President of the old time Telegraphers and Historical Association in 1890; he was also President, I think, of the Railway Club, of St. Paul, and of various other organizations; that is evidence enough to testify to the greatness of the man.

President Camp: I would like to add my testimony to those of the other gentlemen who have spoken. It is quite true I have not met Mr. Hope very often, but on the few occasions when I did I found him a very genial, pleasant gentleman, and since my connection with this Association I have found him one of the most active members that we had. I do not know that I can add anything further to what has been said by the others present. I would like if any gentleman here feels like saying anything that they would simply rise.

Mr. Kinsman: I would like to just simply state that I had an intimate acquaintance with Mr. Hope covering a period of more than 30 years. I have visited him in his home a good many times and he has visited me in mine. We have worked together. We have been to see each other on business, especially in the signal business in the early days when we were both in charge of the signaling service in our respective roads, and after all those years I can fully and most feelingly endorse all that has been said as to the goodness and the greatness of the man both in a business way and in a social way. In everything that tended to advancement and progress of the telegraph, the telephone and the signaling work he was always right at the front.

President: Gentlemen: We will now take up in reference to Mr. C. P. Adams, of the Southern Road. Mr. Adams joined the Association when it met in Montreal in 1895. At that time he was Superintendent of Telegraph, I think, of the Great Northern. Mr. Green, may we have some remarks from you in regard to the late Mr. C. P. Adams

Mr. Green: My acquaintance with Mr. Adams extended over six or eight years, I think at the time he was manager of the Great Northern Telegraph System he had more or less close relation and business together with me, and it was always a great pleasure to do business with Mr. Adams. Genial, fine fellow, very zealous of workingmen, and a man that stood high with his officials, a member whose loss we will feel. I think there are others here who knew him more intimately perhaps than I did.

President: Mr. Fisher, can we have a few words from you?

Mr. Fisher: Mr. Chairman and Gentlemen: We do not, I am afraid, as was remarked by Mr. Chenery, regard the inevitable as much as we should. We all know that sooner or later our time will come; it does not impress us very much until some of our friends are taken, and then the mysterious awe brought about by the death makes an everlasting impression on our minds. In connection with Mr. Adams, I had very little acquaintance with him; I came in contact with him several times in the meeting of the Association, and can say that I had a very warm regard for him. He was of a kindly disposition, a quiet, reserved and altogether a very nice man.

President: Mr. Sherman.

Mr. Sherman: Mr. President: Mr. Adams was my predecessor on the Central Railway of New Jersey, and although I had no intimate acquaintance with the gentleman up to that time, I feel safe in saying that he was held in a very high esteem by the employees of

the Central Railroad and by all the officers of ~~that~~ company during his administration of this office ; I know because I have heard the employes speak in ~~very~~ high terms of him. Although I have had no intimate acquaintance with him myself, I have always had a great regard for him.

Mr. Griffith: Mr. President: This is indeed a sad hour. Thrice within the year, so far, we have been met by the old grim death. We cannot foretell what the next year may bring, but we can talk and recall the feelings that we have for those who have left us during the past year. The three men who have thus far been spoken of, it has been my pleasure to know for many years. I was one of the members of this Association who attended the funeral of Charley Adams. While it was rather inconvenient for me to go at the time, I felt that I must pay that last tribute to him, for he deserved it. I have known Charley Adams as a boy; I have seen him grow up from infancy; I have followed his career from his very entrance into the telegraph service. I have been on one end of the wire when Charley Adams was on the other end, and we were both striving to accomplish all that we possibly could within a given time. We were telegraph operators together. A little later in years I met him as a wire chief; we tested wires together, and those of you who have stood before a switchboard in a stormy day recall the days of copper wires and the substantial construction which we have now, what a harrassing position it was for a wire chief to entangle the debris, yet many a time under conditions that would excite or aggravate the most gentle mind I have

been able to get through with Charley Adams at the distant end. There was no condition that would disturb the gentlemanly nature which was born in the man, and that gentle nature, confined as it was to almost quietness, characterized his entire life, and when he passed away we lost one of our deep thinkers, a man who was a man who was a regular attendant at our Association meetings, absorbing all the information that was given out on such occasions, and then going home and putting it into practice in a practical way.

President: Mr. Cline, have you any remarks to make?

Mr. Cline: Mr. President: My earliest recollection of Mr. Adams dates to a time when I was not so well equipped to handle the business of a repeating station as later, and Mr. Adams at that time was my friend. Whenever a difficulty arose in my mind I had to ask Mr. Adams and he cleared the trouble away for me. It was an exhibition of kindness of his heart, and an indication of that spirit of gentleness and kindness that I found later, when it became my good fortune to become better acquainted with him, was a characteristic of the man. In his death I felt a deep personal loss; I am sure that the Association has sustained a great loss, the loss of a member who had its interests at heart, and I am sure that in his death the company that he represented also sustained a loss, because he was a man who was always loyal to its interests. I am glad to be able to say a word in respectful and loving memory of my friend.

President: Mr. Taltavall, have you any remarks to make?

Mr. Taltavall: Mr. Charles B. Adams was a man of unusual executive ability. Frequently our railroad officials stated that they rarely found a man who could pass on papers, executive and otherwise, so speedily and so accurately as he. I heard Col. Clowry make the statement at the time of his death, that the Western Union Telegraph Company had lost one of its most efficient superintendents in the death of Mr. Adams, and I find that he was so regarded by all who knew him. He had an easy, quick way of despatching business that made him valuable to his employers' interests, and that is what held Mr. Adams so closely in touch with high executives.

President Camp: I might say, gentlemen, that I first met Mr. Adams before joining this organization. I had been sent down through various parts of the United States, by my company, looking into telephone propositions. Amongst the gentlemen I called upon was Mr. Adams at Washington. The impression I received at that time has remained unaltered. He was exceedingly courteous and kindly in affording me all the information I could get, and since that time I have received a number of kindnesses at his hands. I have not met him very often, but on the few occasions I did the impression I received of the man was that he was a courtly, kindly gentleman.

President: Now, gentlemen, we come to the last name on the list, Mr. P. W. Snyder, who joined our Association at the last meeting held in Montreal. If any of you can remember Mr. Snyder I would like to hear from you.

Secretary Drew: I have a very pleasant recollec-

tion of Mr. and Mrs. Snyder. When we went down from Montreal to Quebec we happened to get very close to them, and as it was a comparatively new field for us, Mr. and Mrs. Snyder seemed to take it upon themselves to see that we were cared for and showed everything that was of interest. Several times after we returned home Mrs. Drew spoke about Mr. and Mrs. Snyder and how kind they were to us and how much we appreciated their interest in us. They seemed to feel that there was a responsibility upon them for those who were connected with the Canadian Railroads to look after those of us who were not, and to see that everything was done to make the trip pleasant and agreeable. Mr. Jennings, who is with us here today, was likewise very helpful, and it did us a great deal of good; and we all know how Mr. and Mrs. Camp took care of the party. Mr. and Mrs. Snyder at that time impressed themselves upon us as kindly, clever people. After his death I saw a letter that Mrs. Snyder wrote to Mr. Camp, thanking him, and through him the Association, for the floral tribute that he placed at his funeral. I am very sorry I did not bring that letter with me. It was remarkable the courage and the faith and the trust that that woman showed. In spite of her great loss, and in spite of the comparative suddenness of the taking away of her loving companion, that woman showed a remarkable trust in Divine Providence. It was a lesson to me and to my family. I know that Mr. Snyder must have been a lovable man. We all know of the esteem in which he was held, and of which probably Mr. Camp will speak himself, and how people poured out from all the country round about to attend his funeral at

St. Johns, New Brunswick. Mr. Snyder had only been with us at one meeting and a part of a year before he died, but I feel that if he had remained we would have received a great benefit from his membership with us. I am very sorry that he was taken away from us and deeply sympathize with his family.

Mr. Lathrop: I was last year to Montreal to meet Mr. Snyder. You know we meet people sometimes who give us a very good first impression. I was in company with Mr. Snyder considerably during the Montreal convention, and practically all the time during the Quebec trip. My first impression of him was that of a zealous worker, a man who took a great deal of interest in his work and in his company, a very affable gentleman. We became very fast friends on short acquaintance. My wife, likewise, became very friendly with Mrs. Snyder and they exchanged some correspondence afterwards. I also heard from him, and I can only say that it was a great shock to me to hear of his death.

President Camp: Well, gentlemen, I suppose it devolves upon me to make some remarks. I have been associated with Mr. Snyder since 1874 in the service of the Old Dominion Telegraph Company. That is, Mr. Snyder was employed when I first became acquainted with him over the wire, in the Parliament Building at Ottawa during the season. I was wire chief at a little town called Prescott. Afterwards I was transferred to Montreal and became night chief there while Mr. Snyder was also at the Parliament Buildings at Ottawa; in fact, he went there year after year for a number of years. He was a very expert

operator. While he was not what you might call a fast sender, his sending was of that steady continuous kind that got through a very large amount of work. After the amalgamation of the Old Dominion and Montreal Telegraph Companies under the name of the Great Northwestern, controlled by the Western Union Company, Mr. Snyder, who had then become a manager of the Dominion Telegraph Office in St. Johns, N. B., was transferred to the service of the Western Union and the Dominion Telegraph Office closed. For a few years thereafter I was not in the same service directly. He was in the service of the Western Union and I was in the service of the Great Northwestern, and we did not have any direct communication over the wire, as he was in the Manager's office. After the C. P. R. Telegraph Department was formed to take care of the Commercial Telegraph business connected with the railway of which at the time I entered the service of the Canadian Pacific, Mr. Snyder was still with the Western Union. In 1887, when we extended our lines to St. Johns, N. B., our then manager of telegraphs at once decided on Mr. Snyder as our local manager, feeling that there was no other man in that part of the country so suitable for the position. When our lines were, later on in the following year, extended down through Nova Scotia to the Commercial Cable lines, Mr. Snyder, while still holding the position of Manager of the St. Johns office, was also put in charge of all the linemen across the state of Maine and in the province of New Brunswick and Nova Scotia. I was practically their superintendent, although not holding the title. As time passed on and our commercial telegraph business developed to such an extent,

it became necessary to shorten up the divisions of the superintendent. I might say, before then I had been transferred from the position of electrician of the whole system to Superintendent of the Eastern Division, which included the maritime provinces, and therefore Mr. Snyder was directly under my charge. During the time that I was superintendent he proved to be one of the most efficient managers of the division in every respect, not even excepting the managers of the offices such as Montreal, where business was very great. Mr. Snyder's work always was in such a state that the traveling auditor could drop in there unannounced and probably get through his whole business inside of half an hour. Everything was kept up to date, in such a ship-shape manner that there was no looking for errors, omissions or anything else. When I was transferred to the position of electrical engineer of the system it was decided to cut up this Eastern division into two, and the first man thought of to fill the position of superintendent of the Atlantic Division was Mr. Snyder. As he had in fact been superintendent of that territory for a number of years, and had kept up the work in such a manner that there was no question about him being entirely fitted for it. He continued to hold the position until the time of his death. The manager of the system, General Superintendent of the Lines, Mr. James, who happened to be East on a similar sad occasion, and I, together with some other Montrealers, went specially to St. Johns to attend the funeral. I understand that it was one of the largest that has been held there for a long time. The linemen and the managers of all the offices in the

district, who could possibly be spared from their work, came there, and in such esteem was Mr. Snyder held by the people in Nova Scotia and New Brunswick that there was quite a number of people in other kinds of business who also came to the city. During the whole time that I have known him, from 1874 to date, I have found him one of the most honest, good living men that I know. By his death the C. P. R. lost a first-class superintendent.

Mr. Jennings: My acquaintance with Mr. Snyder was principally over the wire. I met him on several different occasions, at various times, and found him in every respect such as has been described of him. I think also he was very much interested in church work in different ways. On one visit to St. Johns I happened to arrive there at a time while he was connected with holding a church festival, and he impressed upon my mind very forcibly the interest he took in the matter. He made me assist him that evening in the duties at the church festival. I think from my acquaintance with him he has proved himself a thorough Christian in every respect; I do not know any one I would speak more highly of.

President: Gentlemen: This practically ends the special meeting that we have been holding, unless there is any resolution to be offered.

Mr. Cline: I think we should all unite in an expression of sympathy to the families of our deceased associates, and that we should convey to them an expression of the high esteem in which we hold them, and I therefore move you that a copy of the minutes

of this session, or so much thereof as may relate to the individual deceased members, be sent to their families, and that the motion be adopted by a rising vote.

Mr. Drew: I second the motion.

(Carried unanimously by rising vote.)

(Regular business session reconvened at 2:30 under the head of New Business.)

President: Gentlemen: Our time is now getting short; we are under the head of new business. As there is no provision made for the selection of the next regular place of meeting, I presume that comes up under this head,—unless you wish to take up the next order, which is election of officers.

Secretary Drew: I move we proceed to selection of the place of the next annual meeting, Mr. President.

President: If there are no objections, we will take that up.

Mr. Secretary, what invitations have you to bring forward?

Secretary: We have invitations from the following places: Denver, Rochester, N. Y., Atlantic City, St. Louis, Milwaukee, New Orleans, Niagara Falls and Chicago. There is a gentleman here from Niagara Falls and also a gentleman from Chicago, whom I think it is no more than fair we should allow to present their views on those places.

Mr. Dyer: Mr. Chairman: I would ask that Los Angeles be added to that list. I received a telegram this afternoon requesting that I extend an invitation, and, while we are not as enthusiastic and anxious this time as we were a year ago, I think if the meeting was held in Los Angeles this year you would be given an extraordinary opportunity for enjoyment and pleasure. I was only reminded this morning that Los Angeles still has a desire that the Telegraph Superintendents convene there at some future date, and if it is the sense of the meeting, if it is to the best interests of the meeting to hold the next convention some place else, we will retire as gracefully as we can, but if the business

can be handled just as well, and the gentlemen desire to go to Los Angeles, I assure them the best of treatment.

President: We will hear from Mr. Cutler, of Niagara Falls.

Mr. Cutler: I assure you I will not take up more than five minutes of your time. I want to say that I am very proud to be privileged to speak to a body of men who could pause in the busiest season while your business is pressing to speak such glowing tributes to your absent members who will answer your roll call no more. And now, on behalf of the Bureau of Conventions of the City of Niagara Falls, of which I am Secretary and General Manager, for the citizens generally—and for many years I might say for the municipality—I extend to you a most cordial invitation to select Niagara Falls as the meeting place for your next convention. Being railroad men, I need not dwell upon this as a railroad center, and its facilities for assembling a convention are good, and I am satisfied more than one-half of your members can ride there within a night's ride, and that may appeal to you in a way, but you are familiar with all that. You know of its scenery, it being the only place where that scenery can be seen, and to members of your culture and taste, and your leaders as well, I have no doubt that will be appreciated. There are only two or three things that I will cite your attention to. One very important thing is about the changed conditions of our hotel facilities there: they are now excellent. The hotels, several of them, have been altered, and enlarged and improved. The International Hotel there is being completely rebuilt and entered on a new management. Henshaw and Steinman, who acquired a famous reputation all through the country for the table they set and hotel they ran at the Broezeel House at Buffalo. Hundred of thousands of dollars are being spent on it. And another thing. It does not perhaps make much

difference whether you pay \$15 a day for your board, but our hotels are on the American plan, and the highest plan you can pay, with private bath, hot and cold running water, is \$5 including all you can eat; and we have several elegant hotels at \$2 a day. Of course if you want to go into those fluids, and flow of currents and such things that you are talking about, we have currents there, and can supply you with all the juice you want for your experiments; and we have another kind of juice there, besides the kind that is made in Milwaukee. Should you come there I will make it a point to be home that I may enjoy your society and try and cultivate your friendship. And I want to say also, as you don't know it, that it is usually accorded me to act as Chairman of the Ladies' Committee. The ladies say I am pretty handy, and I know that I will impress the gentlemen as absolutely safe. I am assured by the Board of Trade that arrangements are about to be closed whereby the Falls are to be illuminated permanently and they tell me, by three billion candle power; that is beyond my comprehension, but I suppose you will understand.

Mr. Selden: I suggest consideration of the City of Washington. This Association has never met there but once. Many of the members have never been there. There is enough to see in Washington, without going outside of the Government Buildings, to keep you busy a week, and if your meeting was held in May, with the sails down the Potomac River, there is an opportunity to visit the family where the American Flag was born and the Star Spangled Banner still waves at that same spot. We shall be glad to make things as pleasant as we know how at that place.

Mr. Griffith: At a late hour I was glad to see an entry made that will enable me to make an attempt at least to redeem myself. The name of that town came up in our convention at Niagara Falls, and you will remember, as

your Chairman, I cautioned you not to play it, for the reason that we had so many subjects to consider and act upon next—this—meeting, that I thought a central point would be best suited to the best interests of the organization and the railroads we represent. At this meeting we have created practically a new organization. We have provided for divisional meetings. At these divisional meetings the subjects of this organization are considered and the views and minutes of these meetings are exchanged between the two divisions so that now when we meet in annual convention we are in a position to know exactly where we stand, whether we meet in St. Louis, New Foundland, or in Los Angeles, California. We have met in Niagara Falls; we have met in Washington, and we can go to Los Angeles at any time of the year and meet in any convention hall, and be comfortable.

Gentlemen: I move that our next meeting place be Los Angeles, California.

Motion seconded.

Mr. Chenery: I would not be considered loyal to my own town if I did not call attention to some of the advantages and the summer resorts of the Southwest. Some mention has been made of currents and fluids, and I want to say that we manufacture them down there. Milwaukee does not get the best of us at it. St. Louis probably is the father of the summer resort, and probably has the finest open air gardens in the country, and we have never met in St. Louis. Had our meeting this year been in the far East or far West, I would insist on your coming to St. Louis next year, and I shall be glad if you will vote that way.

Mr. Ryder: In view of the eloquent invitations that have been extended I feel absolutely, utterly unable to present the name of the city of which I am an humble resi-

dent, and I believe there is no need for any remarks on the subject of Chicago, and what Chicago can and will do. You know the city slogan is "I will," and I promise you that if you come to Chicago next year that "I will" will win.

Secretary Drew: I would like to say a word for Chicago myself. I went to Chicago first in '78. Chicago has a wonderful advantage in its position; it can be reached so easily and readily by all the members, and very many who do not live there are very glad to come to Chicago, they have heard so much about it, and they have always had such good meetings when they have gone there. So I want to say, not as Secretary of this Association, but as a resident of Chicago, that if you go there you certainly will not regret it.

Mr. Dyer: I would say one more word: that as far as the Committee on Entertainment is concerned, I believe that I am safe in saying that, without any untruth at all, you will have the best time of your life if you do go to Los Angeles. There are so many natural attractions, and as far as hotels are concerned, there is in the neighborhood of 120 first-class hotels, and if there is not room enough in these, we will go to some little suburban town, 20, 30 or 50 miles away where they will accommodate you. Any one who has ever been there understands what the entertainment can be, and if you decide to go there I will try and get up some side issues that the others have not seen.

Mr. Griffith: The assurance of Mr. Dyer, his own personality and the knowledge we have of him is sufficient in itself to make Los Angeles a unanimous decision.

President: Gentlemen: Before I put the motion I want to say that the furthest point we have met in the West was Denver. We met there in '92 and 1906, twice; Chicago has the distinction of having held meetings three times: that is, you can consider the meeting of 1882 and the time the organization was formed as one of the meetings. Outside of

that the only place at which the Association has held its meeting on three occasions is Detroit; Detroit is the first to have that distinction. Now an analysis of the table showing the places we have met gives, considering Detroit as in the West, 13 to the West and 15 to the East; that is, 15 meetings have been held East of Detroit during the life of the Association, and 13 meetings including the present one in Detroit and West.

Mr. Selden: Allow me one moment to move the flag from Washington to Los Angeles.

MOTION CARRIED.

President: The next question is the time of meeting. Now, Mr. Dyer, we will hear from you as to the best month, and thanks to the Association for what we are doing for you.

Mr. Dyer: Mr. Chairman and Gentlemen: The first thing I want to explain is the fact that notwithstanding the appearances, and the active work done by my dear friend Mr. Griffith, he was not bought up. I believe I did come in contact with every other member of the Association except Mr. Griffith. But in regard to the date on which the convention should be held I am free to say that it makes no difference whatever. I would ask the members to take into consideration which would be the best time for most of them, especially those of the East, to come to Los Angeles. It makes no difference whether it is held in January or in May or any other month; I am sure you will find the weather suitable for a fine entertainment. I am without authority at this time, as I had before from the Mayor and the Chamber of Commerce, the Manufacturers' Association and various other bodies to assure you of a warm welcome, but I believe that that is forthcoming. I desire to thank you all heartily for deciding upon Los Angeles, and I am quite sure that you will not be disappointed. I shall do the best I can to give you one of the best times you have ever had.

Mr. Griffith: I supported the motion for Los Angeles; I should like to move the time. It has been my pleasure to live in Los Angeles and be somewhat acquainted with that territory, and I will confess that I had also a secret motive in naming Los Angeles. It is true I was not bought; I am glad that my friend Dyer announced it; but we have been to Montreal, we went into a foreign country last year. Now we are reaching out for Mexico and we are getting pretty close to it, and I think that our friend Dyer will see that the railroads be made acquainted with the time and place of our meeting, and that he notify them to attend, and see if we cannot reach into Mexico, and I would suggest as the time the month of May, for this reason. It will be a pretty long road for some of us, myself in particular, and, well, the fact is that a portion of the road is going to be pretty warm, although it will be very comfortable after we get there if "we select the middle of May for our meeting, the exact dates to be fixed by the Executive Committee." I make that as a motion.

Mr. Selden: I second the motion.

(Carried.)

President: The new Constitution provides that the Chairman of the Eastern and Western Divisions shall be elected by those divisions. The present Chairman will hold over until the first meeting of the divisions, after this annual meeting. They are also members of the executive meeting until then. Next in order is the nomination and election of officers of the Association.

The election resulted as follows:

President: John L. Davis.

First Vice-President: I. T. Dyer.

Second Vice-President: G. A. Cellar.

Secretary and Treasurer: P. W. Drew.

President: I would ask Mr. Kinsman if he will kindly escort the newly elected President to the Chair.

(Newly elected President Davis is escorted to the Chair.)

President Camp: Mr. Davis, you have been duly elected as President of this organization for the ensuing year, and I can only assure you that if you have as pleasant a time during the year as I have had in the past, you will not regret it. I know that according to the new constitution you will catch this year what I got last, but I feel satisfied from my experience of your various performances, I might say, at the different meetings at which I have been present, that you will so satisfactorily fulfill that position that they will wonder why they ever elected the past incumbent to such an office. I present to you this Gavel, which you will retain in your possession and hand over to your successor. I congratulate you on your election, Mr. Davis.

Gentlemen: Before I get altogether away from this corner of the room, I wish to thank you all most sincerely for the support which you have given me during the past year, and also for the very great aid and assistance I have received from the Secretary and Treasurer. He has been with the organization so many years that he knows all the ins and outs of it, and what few acts I have been called on to perform have been done largely on the suggestion of our most esteemed Secretary-Treasurer. (Loud applause.)

President Davis: Members of the Association of Railway Telegraph Superintendents: I will truthfully say that I was never more surprised in my life. I have always been under the impression that we should have as President of this Association the most able man that we can find; I do not believe that we should have the youngest member of the Association in the position. My hair is grey, but I doubt if there are many members of the Association, if any, holding

a position of Superintendent of Telegraph who are barely 36 years of age. It seems to me that you have made a mistake by electing to this position a man who is not at least 40. The importance of this Association is rapidly growing; it has grown with leaps and bounds during the past four years, during the time that I have had the pleasure and the honor to be a member. Some little time ago I figured out approximately the number of miles of telegraph wire for which the members of this Association are held responsible, and it may surprise you to learn that if that wire were attached end to end, it would encircle the globe $38\frac{1}{2}$ times.

We hear from time to time of the importance of the railroads, what it means to the commerce of our country. I never hear a remark on that subject without thinking of the importance of the Superintendents of Telegraph organization, and the importance of the telegraph departments of the various railroads. Nearly all of our railroads have contracts with either the Western Union or the Postal Telegraph Company. Those wires of the Commercial companies include the wires over which the orders are sent to buy and to sell; over these commercial wires are sent the messages that say, "Come home at once." If it were not possible to instruct a man to buy or to sell when he is hundreds of miles away from headquarters, the railroad would be a different proposition from what it is today. Our means of communication is the real life of it. Gentlemen, I shall do the very best I can to take care of the duties that have been entrusted in me, and I wish to thank you for this expression of confidence. (Prolonged applause.)

President Davis: The Committee on Resolutions will make their report.

Mr. Ryder: Your Committee on Resolutions begs leave to make the following report:

RESOLVED, that the thanks of the Association are due, and are hereby extended, to the several interests enumerated below, who have materially contributed to the success of this our Twenty-Eighth Annual Meeting.

The Entertainment Committee, and particularly Mr. Hall, of the Passenger Department of the Michigan Central Railway, who so ably and successfully assumed the duties of the Chairman, our late and beloved member.

The various railroad companies, and particularly the Grand Trunk Ry., who provided special service to Port Huron.

The Pullman Company,
White Star Line,
Pontchartrain Hotel,
Western Union Telegraph Co.,
Postal Telegraph Co.,
Long Distance and other telephone companies,
Exhibitors.

W. W. RYDER, Chairman,

E. A. CHENERY,

E. P. GRIFFITH,

Committee.

Upon motion, the convention adjourned to meet at Los Angeles on a date to be set by Executive Committee.

EXHIBITS AND REPRESENTATIVES AT THE CONVENTION.

The exhibits at the convention were more numerous than usual and especially attractive, receiving much favorable comment from those present.

The General Railway Signal Company displayed for the first time their selective train despatching apparatus, the invention of G. H. Groce, Superintendent of Telegraph and Signals of the Illinois Central Railroad. Their exhibit attracted much attention from the fact that it was entirely different in construction from any of the others shown involving principles in successful use in railway signal apparatus. They were represented by W. W. Salmon, President; George D. Morgan, Vice-President and Treasurer, and M. F. Geer, Sales Engineer of the company, Rochester, and W. G. Hovey, Special Agent at New York.

The Sandwich Electric Company was represented by H. O. Rugh, C. S. Rhoads, Jr., and E. Parsons. They demonstrated the operation of the selectors and adjustable telephones. A distinctive new feature was shown in a cordless jack box enabling one telephone to be used on a number of circuits without the possibility of cord trouble.

The interests of the Kerite Insulated Wire and Cable Company of New York were ably taken care of by Percy W. Miller of their New York office. The Watson Insulated Wire Company, the Western representative of this concern, was represented by J. V. Watson and B. L. Winchell, Jr.

The Duplex Metals Company of New York displayed in the corridor just outside of the convention parlor an electric sign representing a cross section of their copper clad steel wire. They were represented by J. B. Given, Vice-President and J. T. Kinder, Secretary of the Company, and J. E. Ham of their Chicago office.

The Okonite Company, of New York, was represented as usual in the person of their genial salesman, John Langan.

Mr. J. J. Ghegan, President of the J. H. Bunnell and Company, Incorporated, New York, was present at the convention as usual, and distributed combination pen and pencil holders to the gentlemen and change purses to the ladies.

The Stromberg-Carlson Telephone Manufacturing Company of Rochester, N. Y., was on hand with an attractive display of their selective despatching equipment showing a master station and three line stations. They also showed a complete line of their standard telephone apparatus consisting of iron clad railway telephones, jack boxes, portable and semi-portable telephone sets and magneto wall telephones. Their exhibit was in charge of E. O. Munson, assistant advertising manager, and Messrs. Hague, Gibson and Button, of the Rochester office; J. O. Oliver, of Philadelphia, and E. C. Lewis, of Chicago.

The Rock Island Battery Company, of Cincinnati, was represented by Mr. M. S. Rosenthal, President of the company, and Phillip Cass and F. C. Ketzell. They displayed a complete line of their dry batteries showing the construction of the various parts.

The Dean Electric Company of Elyria, O., displayed their indestructible apparatus. The feature of their receivers and mouthpieces which should be of value for rough usage such as many instruments have to meet in railway service is their construction of drawn metal covered over with black composition giving them the usual appearance of such apparatus at the same time insuring them from breakage. Their exhibit was in charge of Messrs. A. D. T. Libby and A. B. Smith.

The United States Electric Company of New York, exhibited both their multiple and single station selective calling systems with master selector and several station equipments in operation on each system. Their single station central battery selector, by means of which any station on the line may be called in from two to eight seconds, has been found to meet successfully the demands of nearly all railway systems. The company was represented by H. E. Merrell,

general manager, E. R. Gill, electrical engineer, and M. E. Launbranch, manager of the Chicago office.

The interests of the Railway Supply Company of Chicago were represented by E. W. Vogel, signal engineer of the company.

G. M. Dodge of Valparaiso, Ind., exhibited to those interested his automatic self-teacher of telegraphy.

John A. Roebling's Sons Company of New York was represented by R. R. Newell of the Trenton office, G. W. Swan of New York and W. H. Slingluff of the Chicago office.

The Railway Telephone and Electric Company, LaFayette, Ind., exhibited a full line of their railway telephone apparatus. Their exhibit was in charge of O. T. Lademan, general manager of the company.

The Kellogg Switchboard and Supply Company of Chicago was represented by J. C. Kelsey, G. A. Joy and Edward Parliament. They displayed a full line of their telephone equipment of various styles for use in connection with telephone train despatching.

The Egly Registry Company of Dayton, O., was represented at the convention by M. C. Stern, treasurer and general manager.

Charles E. Davies, chief operator of the Great North Western Telegraph Company at Ottawa, Ont., in response to requests from several of the superintendents exhibited a full set of his telegraph repeaters, which are giving such good satisfaction in Canada. Mr. Davies' invention gained a favorable impression and several of those present contemplate giving it a trial. Its predominating features are its simplicity and ease of adjustment which is no more complicated than that of an ordinary relay.

The Western Electric Company's exhibit occupied two rooms on the parlor floor. A full line of telephone apparatus

for railway service was displayed, also Gill and Cummings-Wray selectors. Several types of portable or train telephones were shown as well as various styles of transmitter arms for train despatching service. A paper weight of oxidized bronze was distributed to visitors as souvenirs. The company was represented by W. E. Harkness, sales engineer; Messrs. H. L. Burns and R. F. Spamer of New York, and C. L. Howk and J. H. Finley of Chicago. In addition to these gentlemen H. D. Crouch, sales manager of the Northern Electric and Manufacturing Company of Montreal, the Canadian Branch of the Western Electric Company. Mr. Lovelidge, the dry battery expert of the Western Electric Co., was also present and read an interesting paper upon the subject of "Dry Batteries."

ASSOCIATION
OF
Railway Telegraph Superintendents

PROCEEDINGS
OF THE
Annual Meeting Held at Los Angeles, Cal.

JUNE 20th, 21st, 22nd and 24th, 1910.

CONSTITUTION, BY-LAWS, LIST OF MEMBERS, ETC.

Press of
J. H. Yewdale & Sons Co., Milwaukee, Wis.

ANNOUNCEMENT

The Association was formed in Chicago, November 20, 1882.
Its object is the improvement of the railway telegraph service.

The next annual meeting will be held at Boston, Mass., June
19th to 23rd, 1911

The undersigned will be glad to answer any inquiries in reference
to the Association.

I. T. DYER, President,

Los Angeles, Cal.

J. B. SHELDON, 1st Vice-President,

Omaha, Neb.

WM. BENNETT, 2nd Vice-President,

Chicago, Ill.

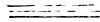
P. W. DREW, Sec'y and Treas.,

Chicago, Ill.

25 Mr. 11 1882

THE ASSOCIATION
OF
Railway Telegraph Superintendents

Organized in Chicago, Nov. 20th, 1882.



CONSTITUTION AND BY-LAWS.

OFFICERS

PRESIDENT.

I. T. Dyer.....Los Angeles, Cal.
San Pedro, Los Angeles and Salt Lake Ry.

FIRST VICE-PRESIDENT.

I. B. Sheldon.....Omaha, Neb.
Union Pacific R. R.

SECOND VICE-PRESIDENT.

Wm. Bennett.....Chicago, Ill.
Chicago and Northwestern Ry.

SECRETARY AND TREASURER.

P. W. Drew.....Chicago, Ill.
Minneapolis, St. Paul and Sault Ste. Marie Ry.

EXECUTIVE COMMITTEE.

I. T. Dyer, Chairman
J. B. Sheldon
Wm. Bennett
P. W. Drew
C. Selden
E. A. Chenery

EASTERN DIVISION.

Chairman.....C. Selden.....Baltimore, Md.
B. & O. R. R.

WESTERN DIVISION.

Chairman.....E. A. Chenery.....St. Louis, Mo.
Missouri Pacific Ry.

AUDITING COMMITTEE.

Mr. A. B. Taylor Mr. L. A. Lee

TOPICS COMMITTEE.

Mr. W. C. Walstrum
Mr. W. L. Connelly
Mr. U. J. Fry

SPECIAL COMMITTEES

COMMITTEE ON HIGH TENSION WIRE CROSSINGS.

G. A. Cellar	C. A. Parker
G. H. Groce	J. M. Walker
W. W. Ashald	Wm. Bennett
W. P. Cline	S. A. D. Forristall
C. Selden	J. G. Jennings

COMMITTEE ON MISCELLANEOUS MATTERS.

W. F. Williams	
S. L. Van Aiken	
F. T. Wilbur	
W. W. Ryder	
George Boyce	
B. F. Frobes	

COMMITTEE ON RESOLUTIONS.

Mr. W. W. Ryder
Mr. E. P. Griffith
Mr. E. J. Little.

COMMITTEE ON FORM FOR DELIVERY OF MESSAGES TO TRAINS, ETC.

E. P. Griffith	
C. M. Lewis	
W. J. Camp	
Wm. Bennett	
J. C. Johnson	

ENTERTAINMENT COMMITTEE.

Mr. S. A. D. Forristall	
Mr. N. E. Smith	
Mr. W. Marshall	
Mr. M. Magiff	
Mr. B. A. Kaiser	
Mr. P. W. Miller	
Mr. A. P. Eckert	

LADIES' RECEPTION COMMITTEE.

Mrs. C. F. Ames	
Mrs. L. J. Shay	
Mrs. Geo. W. Conway	
Mrs. N. E. Smith	
Mrs. M. Magiff	
Mrs. S. A. D. Forristall	

ASSOCIATION OF RAILWAY TELE- GRAPH SUPERINTENDENTS

CONSTITUTION, BY-LAWS AND STANDING RULES

CONSTITUTION

ARTICLE I.

Name.

Name This organization shall be known as the Association of Railway Telegraph Superintendents.

ARTICLE II.

Object.

Object The object of this Association shall be the advancement of the efficiency of the telegraph, telephone and other electrical departments of the railroad service.

ARTICLE III.

Membership.

Sec. 1. Membership in this Association shall be of three classes, active, associate and honorary.

Active Sec. 2. Active members shall be those who are connected in an official capacity with the telegraph, telephone or their electrical departments of any railway.

Associate Sec. 3. Associate members shall be those who are engaged in professions or business directly or indirectly connected with the operation of railways.

Honorary Honorary membership may be conferred upon those who have attained eminence in the telegraph, telephone or other electrical service, or who have in any manner contributed to the success of this Association.

- Applications** Sec. 5. All applications for membership shall be made in writing to the Secretary and presented by him to the Executive Committee. If approved by the Executive Committee, the applications shall be presented to the Association for action at the annual meeting.
- Vote** Election of active and associate members shall be by ballot, and seven negative votes shall exclude from membership. It shall require a unanimous vote by ballot to elect honorary members.
- Rejection** In case of rejection of any candidate his application and its consideration shall not be mentioned in the published proceedings.
- Form** Application for admission to active or associate membership shall state the candidate's name, occupation and address. Proposal for honorary membership shall be signed by an active member, shall give the present position of the party proposed and an outline of his professional or business career.
- Rights** Sec. 6. The right to hold office, vote and attend executive sessions shall be vested in active members only. Associate and honorary members shall be entitled to all other privileges of the Association.
- Resignations** Sec. 7. Any member may resign his membership by formal withdrawal after payment of all dues and assessments to date.

ARTICLE IV.

Divisions.

- Formation** Sec. 1. This Association shall be divided into two divisions. Those members whose headquarters are east of the eastern limit of Central Time shall form the Eastern Division, and those west of said limit shall form the Western Division.
- Officers of** Sec. 2. Each division shall elect its chairman at first meeting of such division following the annual meeting of the Association.
- Rules Governing** Sec. 3. Each division may make its own regulations in so far as they do not conflict with the rules governing the Association.

ARTICLE V.

Officers.

- Officers** Sec. 1. The officers of this Association shall be a President, a First and a Second Vice-President, a Secretary and a Treasurer. The last two offices may be filled by one person.

- Ex. Com.** Sec. 2. The officers of the Association, together with the Chairman of each division, shall constitute an Executive Committee.
- Election** Sec. 3. Nomination and election of all officers shall be by ballot and plurality vote shall elect.
- Term** Sec. 4. The term of each officer shall begin at the installation of officers at the annual meeting at which he is elected, and continue one year or until his successor is duly elected.
- Vacancy** Sec. 5. If a vacancy occurs in any office it may be filled for the balance of the year by appointment by the President approved by the Executive Committee.

ARTICLE VI.

Meetings.

- Annual** Sec. 1. The majority vote of the members present at the annual meeting shall designate the time and place of the next annual meeting.
- Special** Sec. 2. Special meetings of the Association may be called by the President or any two members of the Executive Committee. No business shall be transacted at special meetings except that stated in the call.
- Ex. Com.** Sec. 3. Meetings of the Executive Committee shall be upon call of the President or any two members thereof.
- Divisional** Sec. 4. Two meetings of each division shall be held each year. The meetings of the Eastern Division to be held in the months of November and March, and of the Western Division, in September and January, at a time and place to be designated by the chairman of the division, of which due notice shall be given to the members thereof by him; additional meetings may be held upon the written request of two members of the division.

ARTICLE VII.

Quorum.

- Quorum** Fifteen members shall constitute a quorum at all meetings of the Association and five members at all meetings of its divisions.

ARTICLE VIII.

Amendments.

- Amendments** This Constitution may be amended at any annual meeting by a two-thirds vote of the members present, the proposed amendments having been submitted in writing to the Executive Committee and a copy having been sent to each member by the Committee thirty days prior to the meeting at which they are to be considered.

ARTICLE IX.

Roberts' Rules of Order shall govern the deliberations at all meetings when not in conflict with the Constitution and By-Laws herein set forth.

BY-LAWS

ARTICLE I.

Dues.

- Dues** Sec. 1. The annual dues for both active and associate members shall be seven dollars and fifty cents (\$7.50), payable in advance, on or before July 1st.
- Assessments** Sec. 2. When necessary to meet expenses in excess of receipts a pro rata assessment may be levied upon active and associate members.
- Sec. 3. Honorary members shall be exempt from all dues and assessments.
- Arrears** Sec. 4. Any member who is in arrears in payment of dues or assessments ninety days after the annual meeting shall be considered suspended, and his name shall be dropped from the roll of membership.
- Reinstate** Sec. 5. A member who has been suspended for non-payment of dues or assessments may apply to the Executive Committee for reinstatement, such application to be accompanied by all dues and assessments in arrears. A majority vote of the Executive Committee will reinstate.

ARTICLE II.

Duties of Officers.

- President** Sec. 1. It shall be the duty of the President to preside at all meetings of the Association and of the Executive Committee; to have general supervision of all business and to sign all orders upon the Treasurer.
- Vice-President** Sec. 2. It shall be the duty of the First and the Second Vice-President in their order to perform all the duties of the President in his absence or inability to act.
- Division Chairman** Sec. 3. It shall be the duty of the Chairman of each division to preside at all meetings of his division and to have general supervision of the business of such division.

Secretary

Sec. 4. It shall be the duty of the Secretary to keep the records of all meetings of the Association and Executive Committee, and to compile information for the use of the Association and of the various committees thereof which he may from time to time be directed to obtain; to keep an accurate classified list of the membership of the Association with the address of each member; receive and present all applications for membership; issue all notices; draw all orders on the Treasurer; prepare, have published and mail to each member within a reasonable time after the annual meeting, two copies (standard size, 6x9) of the proceedings of such annual meeting; attend to the correspondence of the Association, and perform such other duties pertaining to his office as the Executive Committee may direct.

Treasurer

Sec. 5. The Treasurer shall have charge of all funds of the Association; shall pay upon presentation of orders signed by the President such bills as have been approved by the Executive Committee; receive all moneys due the Association; keep an accurate account of all receipts and disbursements; make report to the Executive Committee when called for by that body, and to the Association at the annual meeting.

Ex. Com.

Sec. 6. The Executive Committee shall have general management of the affairs of the Association. No unusual or extraordinary expenses shall be incurred without its approval.

ARTICLE III.**Committees.****Standing**

Sec. 1. The Standing Committees shall be as follows: Auditing, Entertainment and Topic. The President shall be ex-officio a member of all committees without the right to vote.

Auditing

Sec. 2. The Auditing Committee shall consist of two members of the Association appointed by the Executive Committee. This committee shall audit the accounts of the Treasurer and report at the annual meeting.

Entertainment

Sec. 3. The Entertainment Committee shall consist of seven members, four active and three associate, appointed by the President.

Topic

Sec. 4. The Topic Committee shall consist of three members appointed by the President.

ARTICLE IV.**Amendments.****Amendment**

These By-Laws may be amended by a two-thirds vote of the members present at the annual meeting.

STANDING RULES.

Order of Business

1. At all meetings of the Association the Order of Business shall be as follows:

- 1 Registration of members present.
- 2 Consideration of minutes.
- 3 Addresses.
- 4 Announcements.
- 5 Election of members.
- 6 Reports of Officers.
- 7 Report of Executive Committee.
- 8 Reports of Standing Committees.
- 9 Reports of Special Committees.
- 10 Unfinished business.
- 11 New business (including papers and their discussion).
- 12 Election of officers.
- 13 Installation of officers.
- 14 Adjournment.

Printing of

2. Papers for presentation at the annual meeting must be prepared and in the hands of the Chairman of the Topic Committee sufficiently early to permit of the Secretary having same printed and distributed to the members fifteen days before the annual meeting convenes.

Restriction

3. No patentees or their agents, nor manufacturers or their representatives shall occupy the attention of the meeting with matter pertaining to the article which they may represent or handle, unless they are especially invited to do so by the Executive Committee when such article forms a part of the subject matter under discussion for that particular meeting.

Published Proceedings

4. A copy of the Constitution, By-Laws and Standing Rules, also an alphabetical list of the members, showing their full name, address and official title, shall be published in the proceedings of the annual meeting.

Amendment

5. These Standing Rules may be amended or suspended at any meeting of the Association by a two-thirds vote of the members present.

LIST OF ACTIVE MEMBERS

W. W. Ashald, Supt. Tel., G. T. Montreal, Que.
 Geo. J. Bayliss, Gen. Foreman, So. Pac. San Francisco, **Cal.**
 Wm. Bennett, Supt. Tel., C. & N. W. Chicago, Ill.
 F. E. Bentley, Supt. Tel., T. R. R. Assn. St. Louis, Mo.
 J. H. Brennan, Asst. Supt. Tel., St. L. & S. F. St. Louis, Mo.
 H. L. Bennett, Supt. Tel., H. & T. C. Houston, **Texas.**
 George Boyce, Supt. Tel., C. St. P. M. & O. St. Paul, Minn.
 F. G. Boyer, Supt. Tel., N. T. Co. Oil City, Pa.
 J. C. Browne, Gen. Foreman, Mo. Pac. St. Louis, Mo.
 W. J. Camp, Elec. Engr., Can. Pac. Montreal, Que.
 J. F. Caskey, Supt. Tel., L. V. R. R. South Bethlehem, **Pa.**
 G. A. Cellar, Supt. Tel., Pa. Lines W. of P. Pittsburgh, **Pa.**
 H. C. Chace, Asst. Supt. A. T. & S. F. Los Angeles, **Cal.**
 E. A. Chenery, Supt. Tel., Mo. Pac. St. Louis, Mo.
 J. P. Church, Chief Clerk, Wabash Decatur, Ill.
 W. P. Cline, Supt. Tel., A. C. Line. Wilmington, N. **C.**
 W. L. Connelly, Supt. Tel., C. I. & S. Chicago, Ill.
 C. T. Day, Asst. Supt. Tel., Sonora Ry. & S. P. Empalme, **Son., Mex.**
 E. W. Day, Asst. Supt. Tel., B. & O. Baltimore, Md.
 E. E. Dildine, Asst. Supt. Tel., N. Pac. St. Paul, Minn.
 J. H. Ditch, Ch. Tel. Insp., Pa. R. R. Altoona, Pa.
 G. A. Dornberg, G. Fore., Pa. Lines W. of P. Pittsburgh, **Pa.**
 P. W. Drew, Supt. Tel., M. St. P. & S. S. M. Chicago, Ill.
 I. T. Dyer, Supt. Tel., S. P. L. A. & S. L. Los Angeles, **Cal.**
 L. B. Foley, Supt. Tel., D. L. & W. New York, N. **Y.**
 A. S. Foote, Gen. Foreman, Sunset Lines. . . Houston, **Texas.**
 S. A. D. Forristall, Supt. Tel., B. & M. Boston, Mass.
 W. S. Fender, Asst. Supt. Tel., S. Pac. San Francisco, **Cal.**
 B. F. Frobes, Supt. Tel., O. S. L. Salt Lake City, **Utah.**
 U. J. Fry, Supt. Tel., C. M. & St. P. Milwaukee, Wis.
 J. W. Fry, Asst. Supt. Tel., C. M. & St. P. . . Seattle, Wash.
 T. R. Gooch, C. T. Despr., R. F. & P. Richmond, Va.

O C. Greene, Supt. Tel., N. Pac.....St. Paul, Minn.
 E. P. Griffith, Supt. Tel., Erie.....Jersey City, N. J.
 W. H. Hall, Supt. Tel., M. K. & T.....Denison, Texas.
 T. M. Haston, Supt. Tel., T. St. L. & W.....Bloomington, Ill.
 A. Hatton, Insp. of Trans, C. P.....Winnipeg, Man.
 J. L. Henritzy, Supt. Tel., C. & S.....Denver, Colo.
 Percy Hewett Supt. Tel., Sunset Lines.....Houston, Texas.
 A. T. Hollenbeck, Supt. Tel., C. G. W.....Chicago, Ill.
 Otto Holstein, C. T. Desp., Cen. Ry. of Peru.Lima, Peru.
 E. D. Hubbard, Gen. Foreman, G. T.....Battle Creek, Mich.
 H. L. Husted, Div. Opr., W. J. & S. R. R...Camden, N. J.
 J. G. Jennings, Supt. Tel., C. R. I. & P.....Chicago, Ill.
 F. T. Jennings, Supt. Tel., C. P.....North Bay, Ont.
 J. C. Johnson, Supt. Tel., Pa. R. R.....Philadelphia, Pa.
 W. B. Jones, Supt. Trans. C. I. & L.....La Fayette, Ind.
 L. M. Jones, Supt. Tel., A. T. & S. F.....Topeka, Kans.
 E. C. Keenan, Supt. Tel. L. S. & M. S.....Toledo, Ohio.
 G. C. Kinsman, Supt. Tel., Wabash.....Decatur, Ill.
 V. T. Kissinger, Supt. Tel., C. B. & Q.....Chicago, Ill.
 E. A. Klippel, Supt. Tel., O. R. & N.....Portland, Ore.
 W. M. Knowd, Tel. Mngr., G. C. & S. F. Ry..Galveston, Texas.
 C. L. Lathrop, Supt. Tel., P. S. & N.....Angelica, N. Y.
 L. A. Lee, Supt. Tel., P. & L. E.....Pittsburgh, Pa.
 G. H. Leverett, T. & T. Eng., C. M. & P. S..Seattle, Wash.
 C. M. Lewis, Supt. Tel., P. & R.....Reading, Pa.
 J. H. Lindsey, Supt. Tel., Northern.....Costa Rica, C. A.
 E. J. Little, Supt. Tel., Great Northern....St. Paul, Minn.
 R. L. Logan, Supt. Tel., K. C. Southern....Kansas City, Mo.
 G. N. MacDougald, Sig. Eng., Virginian Ry..Norfolk, Va.
 E. E. McClintock, Supt. Tel., C. & W.....Denver, Colo.
 W. P. McFarlane, Asst. Supt. Tel., C. & N. W.Omaha, Neb.
 J. McMillan, Supt. Tel., C. P.....Calgary, Alba.
 F. J. Mahon, Supt. Tel., C. P.....St. John, N. B.
 M. Magiff, Supt. Tel., Cent. Vt.....St. Albans, Vt.

E. W. Mason, Supt. Tel., W. P. San Francisco, Cal.
 W. Marshall, Supt. Tel., C. P. Toronto, Ont.
 W. S. Melton, Supt. Tel., Q. & C. Danville, Ky.
 G. W. Mersereau, Supt. Const., C. P. St. John, N. B.
 C. W. L. Mickley, Supt. Tel., I. & G. N. Palestine, Texas.
 J. W. Murphy, Supt. Tel., M. & O. Jackson, Tenn.
 J. T. Nolan, Chief Opr., Wash. Ter. Washington, D. C.
 C. A. Parker, Supt. Tel., D. N. W. & P. Denver, Colo.
 E. A. Patterson, A. Supt. Tel., C. M. & S. P. Milwaukee, Wis.
 C. B. Phelps, Supt. Trans., L. & N. Louisville, Ky.
 W. H. Potter, Supt. Tel., Southern Washington, D. C.
 F. S. Rawlins, Supt. Tel., S. Pac. San Francisco, Cal.
 E. F. Raymond, Asst. Supt. Tel., S. Pac. San Francisco, Cal.
 C. S. Rhoads, Supt. Tel., C. C. C. & St. L. Indianapolis, Ind.
 J. F. Richardson, Supt. Tel., C. P. Montreal, Que.
 P. Robinson, C. T. D., Altoona Cen. & H. B. S. Ste. Marie, Mich.
 Thos. Rodger, Insp. Tel., G. T. Montreal, Que.
 Geo. Rooke, Insp. Train Desp., C. P. Montreal, Que.
 J. J. Ross, Supt. Tel., Mich. Central. Detroit, Mich.
 A. E. Roush, Gen. Foreman, P. & L. E. Pittsburgh, Pa.
 W. W. Ryder, Gen. Supt. Tel., N. Y. C. Lines. Chicago, Ill.
 C. Selden, Supt. Tel., B. & O. Baltimore, Md.
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 J. S. Stevens, Supt. Tel., C. & O. Richmond, Va.
 John Tait, Supt. Tel., C. P. Winnipeg, Man.
 A. B. Taylor, Supt. Tel., N. Y. C. & H. R. New York, N. Y.
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Frank Trimble, Supt. Tel., T. & P. Dallas, Texas.
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 R. N. Young, Supt. Tel., C. P. Moosejaw, Sask.

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**Minutes of the Proceedings of the
Twenty-ninth Annual Convention,
Association of Railway Telegraph
Superintendents, held at Los Angeles,
Cal., June 20th, 21st 22nd and
24th, 1910.**

Proceedings of the Annual Convention of the Association of Railway Telegraph Superintendents.

Alexandria Hotel, Los Angeles, Cal.,

June 20, 1910, 1:30 P. M.

FIRST DAY—AFTERNOON SESSION.

The convention was called to order at 1:30 P. M. by the acting President, I. T. Dyer, Superintendent of Telegraph, San Pedro, Los Angeles & Salt Lake Railway Company, Los Angeles, Cal., in the chair.

There were present:

Altoona, Pa.—J. H. Ditch.

Battle Creek, Mich.—E. D. Hubbard and wife.

Chicago, Ill.—Wm. Bennett, wife and daughter, C. H. Bull, Albert Douglas, M. E. Launbranch, E. Parsons, Mrs. W. W. Ryder and two sons, F. H. Van Etten and Fred T. Wilbur.

Denver, Colo.—J. F. Dostal, E. E. McClintock, C. A. Parker and wife, and John M. Walker and wife.

Empalme, Sonora, Mexico—C. T. Day.

Houston, Tex.—A. S. Foote.

Jersey City, N. J.—E. P. Griffith, wife and son.

Kansas City, Mo.—Val B. Mintun.

Los Angeles, Cal.—I. T. Dyer, John W. Gilkyson, C. F. Hartung, wife and son, J. E. McDonald, L. C. McIntosh, A. Roome, L. G. Sloan, and C. G. Pyle.

Montreal, Canada—W. J. Camp.

New York, N. Y.—Wm. H. Baker, Minor M. Davis and daughter, John J. Ghegan, E. Kleinschmidt and wife, George W. Peck, G. M. Seeley, Charles N. Sigison, and G. W. Swan.

Omaha, Neb.—John B. Sheldon, wife and son.

Pittsburg, Pa.—L. A. Lee, wife and daughter.

Portland, Ore.—E. A. Klippel and wife.

Portsmouth, Va.—W. F. Williams, wife and two daughters.

Redlands, Cal.—S. K. Bullard.

Roanoke, Va.—W. C. Walstrum and daughter.

Rochester, N. Y.—G. H. Groce and M. F. Geer.

St. Louis, Mo.—Mrs. E. A. Chenery, K. C. Chenery and Allan MacEwan.

Salt Lake City, Utah—B. F. Frobes.

San Francisco, Cal.—E. K. Dyer, Richard A. Fanto, W. S. Fender, Russel W. Gillette, H. C. Goldrick, S. B. Gregory, E. W. Mason and wife, Elam Miller, F. S. Rawlins, and A. B. Saurman.

Sandwich, Ill.—H. O. Rugh.

Toronto, Canada—W. Marshall and wife.

In opening the proceedings the Chairman said:

Ladies and Gentlemen: It will go without saying that I am glad to see such a large attendance. We will open the meeting with an address by Mr. Joseph Scott, President of the Chamber of Commerce of the city of Los Angeles. I take pleasure in introducing to you Mr. Scott.

Mr. Scott: Ladies and Gentlemen: On behalf of the Chamber of Commerce of this city, I beg to extend to you my cordial greetings and best wishes for the success of your convention. I desire likewise to extend to you my congratulations that at last you have found God's country. I want you to understand that a good number of us also have come from the land of the East, and that you are not really among strangers here. We appreciate that if it were not for the development of just such men as you, we would not have the railroad accommodation to California that we now enjoy. The old pioneers of California used to talk of going back to "the states" to visit their friends and relatives. We have got over that in California now, and we allude to the East as simply back east, and no longer talk of going to "the states."

You are going to see many strange things and to hear many strange things, and are probably going to wonder whether we are really just as we are painted. This is a marvelous landscape out here, and nature is to the painter himself amazing.

There was an unsophisticated and tenderfooted visitor who met an old time friend of his on the corner of First and Spring streets, and the old timer asked the greenhorn what he was doing out here, and he said: "I came out here from the East to see what a damned lot of marvelous things you have to show." And you certainly will find strange things in this part of the world, which will surprise you.

I want to congratulate you on the wisdom you have shown in bringing your wives and sweethearts with you on this occasion—not both, but each one—because this is the land of perpetual honeymoons. And I want to tell the ladies that this is the land of romance and chivalry, the land of old cavaliers, and if you don't find your husbands and sweethearts gallant and attentive out here, why, God help you!

We have a magic island to show you and many other attractions, and are glad that you can leave business cares and worries for the time being and, forgetting all about the dreary routine of life, store up strength and energy for the busy days that will come when you return from your holiday. We are sure that you will be able to enjoy yourselves here, for this is the natural playground of America. There is nothing else like it. We don't play very much ourselves, but we like our visitors, most of whom have come a great ways, to see all that we have to show.

We have got a great big exhibit down in the Chamber of Commerce building, where you can see some of the resources of California, and I ask every one of you to inspect it. You will probably hear a great deal of talk about the country—you will hear it said that we have the finest land and the best people to be found on the face of the earth, and you will probably think us a lot of boosters. There is no place like Los Angeles and no

section just like Southern California. It will be repeated to you on all sides. The people, it may be, do brag a little, but let me tell you, what the booster does is no more than to say what he thinks will redound to the advantage of his part of the country, and he is governed by precisely the same spirit as the business man who boosts his business in seeking its successful enlargement.

While you are with us just give yourselves up to having a good time and enjoy everything you see. We shall be very glad to have you take a look at us while you are here upon invitation of Mr. Dyer, who is one of the assets of the community. I am very glad that he is here, and I believe that he will make good.

We have about 350,000 people here, and all engaged in the same work of boosting this section of the country, and we trust that you will be imbued with the same spirit, and when you go back east you will have a lot to say about what you saw out here, and finally, like everyone who has been here once, you will return, for we want to grow in population; there is room for more, and we want a few more to come in and settle, so that in the next ten years we shall have 1,000,000 people. You will catch the biggest fish out here you ever saw anywhere—in fact, you will find in California all manner of biggest things that ever happened—and even, it may be, the biggest liars.

I most sincerely hope that you will feel at home among us. If there is anything in the city that you want, just go and take it. That is the old brand of California hospitality. In the olden days travelers who went up and down the country, before the days of railway transportation to any large extent, were taken in at every ranch they came to, and the best of everything was offered to them. So now then, I say to you, if they don't offer it to you, they are not worthy of being residents of the state of California, and you just take it and perpetuate the good old custom.

I congratulate you on being here, and I hope you will have the time of your lives.

The President: Mr. E. P. Griffith, Superintendent of Telegraph of the Erie Railway, will respond to the welcome extended by the president of the Los Angeles Chamber of Commerce.

Mr. E. P. Griffith: Mr. President of the Los Angeles Chamber of Commerce, the Association of Railway Telegraph Superintendents thanks you for your very kind welcome. We have eaten your luscious fruit in our homes and we are glad to have this opportunity to partake of your liberal hospitality. It is true that a majority of us are located beyond the "Great Divide," but it has long been our desire to meet in Los Angeles. Some of us have come from a very long distance, but every moment of the journey was made pleasant with the thought that we would reach Los Angeles some day.

Your city was suggested to us by Mr. Dyer as our meeting place, and some of us were slightly acquainted with Los Angeles, but all of us know Mr. Dyer. And when Mr. Dyer, acting as the magnet, wound us closer to the helix of Los Angeles, something had to close and draw us together. I thank you again, Mr. President, for your kind welcome.

The President: Ladies and Gentlemen: You have heard the remarks made by Mr. Scott and by Mr. Griffith. I don't want to keep the ladies here to listen to any more speeches, therefore we will not take up any more time with further talk, except that I wish to call your attention to the programs that have been arranged for our entertainment—the different entertainments that have been provided for you by the local entertainment committee and the courtesy of the different railways, the steamship and electric lines.

The ladies will find automobiles waiting to take them over the city and show them the sights. They will be ready at 2 o'clock and there will be a sufficient number to accommodate

all the ladies and their children, and I should be glad to have them take advantage of the opportunity to see just a little bit of Los Angeles. There will be three hours of sightseeing—it would take three months to see it all, but three hours will give you an idea of what we have here. Therefore we will excuse the ladies that desire to go, and we will proceed to business. I wish to thank Mr. Scott for his kind words. We appreciate them very much.

The Secretary: There are a few active members who have not signed their attendance cards. I wish they would come forward and sign them at once, so we can see how many we have.

Mr. Camp: Mr. President, before we proceed with the business part of our meeting it will be necessary to fill in an office that is vacant at this meeting for the first time, I understand, since the organization of this association—that is, temporary Secretary. Mr. Drew has filled the chair continuously since the time he joined the organization in 1883, but unfortunately, on this occasion he was not able to spare the time to be present. I am sure that all of the members very much regret the circumstance and feel that it is only proper that we should place on the minutes some record of this fact. I now move, Mr. Chairman, that Mr. Van Etten be nominated to fill the chair of Secretary during the present meeting.

The President: Mr. Camp, may I ask you to also nominate some other gentleman to act as treasurer. The idea in doing this is in order to fill the Executive Committee to enable us to proceed with the performance of the necessary duties of that committee.

Mr. Camp: I forgot that both offices are held by one. I think that Mr. Van Etten will be willing to accept both duties.

The President: The idea is that you should fill the places with two members, to complete the Executive Committee at this time, that it may pass on the different matters before us.

Mr. Camp: Then I would nominate for Secretary for the meeting Mr. Van Etten, and for Treasurer Mr. Bennett.

Motion seconded.

The President: Gentlemen, you have heard the motion. All in favor of it will signify it by saying aye. Contrary, no. Passed.

The next order of business is the consideration of the minutes of the meeting held in Detroit. The proceedings of the convention held in that city last year have been printed and distributed to the various members. It will be in order for some one to make a motion that the reading of the minutes be dispensed with.

Mr. Camp: I move that the reading of the minutes be dispensed with.

The President: You have heard the motion. All in favor will signify it by saying aye. Contrary, no. The ayes have it.

The next order of business is the "announcements" by the Secretary. Mr. Secretary, have you things in shape to make those announcements?

The Secretary: I have here a communication from the Pacific Telephone and Telegraph Company, extending the courtesy of their telephone line during the sessions, to the members; also one from the Western Union, extending the same courtesy; and also one from the Pacific Telephone and Telegraph Company, and the Home Telephone and Telegraph Company, and the Long Distance Telephone and Telegraph Company, and one from the United Wireless Telegraph Company. I presume they have a station here, according to that. That is all of the announcements.

Now, if there are any more active members who have not signed the attendance cards we would like to have their names.

The President: I was going to say in reference to these announcements, that it is very possible that we have overlooked some communications received, for we have received so many of them, and the affairs are pretty badly mixed up owing to our regular Secretary being located in Chicago and the correspondence being sent here and elsewhere. We have tried to cover it all. You can see what a great mass of communications we have here.

The Secretary: These are just telegrams and messages, the others are announcements with reference to the invitations to us here.

Mr. Camp: Mr. President, I might say that, although no communication has been received from the Canadian Pacific Telegraph system, if there should be any members who wish to telegraph to any part of Canada for personal business during the sessions, they are very welcome. I believe there are only two members from Canada here, but I wish to make the announcement in respect to any communication from the members.

The President: I thank you very much, Mr. Camp. We have programs here which we will be glad to supply to all of the members here, because you will want to line up for the different entertainments that the Entertainment Committee offer, and particularly the local Entertainment Committee have arranged for the members, both active and associate, providing for this afternoon the automobile ride for the ladies, and for tomorrow a very pleasant trip over the "Balloon Route," the program shows all that. In addition to that, I beg to state in the way of courtesies extended, that General Manager Jamison, of the Wilmington Transportation Company, called me up by telephone and stated that the glass bottom boat manager had extended to us free use of the glass bottom boats during our trip to Catalina Island, and Mr. Pontius, traffic manager of the Los Angeles Pacific Railroad, informed me by telephone that the Miniature Railroad and the Scenic Railway at Venice and the

aquarium there were wide open for the use of the members. We certainly have been treated very nicely by the steam lines and the electric lines and the steamship lines in regard to all these trips that we are going to take—and I hope that you are going to take every one of them—every one complimentary, given to us complementarily. Mr. C. L. Lewis, superintendent of the Postal Telegraph Cable Company, managed to line up a fine trip over the Los Angeles Pacific Railroad, and Mr. A. E. Roome of the Pacific Electric took care of us in the Mount Lowe trip, and Mr. H. C. Chace, Assistant Superintendent of Telegraph of the Santa Fe, secured a special train over what is called the “Kite Shaped Track,” which takes in the orange groves and little suburban cities. And one of the nicest of all is the trip to Catalina Island, arranged by the local committee. We leave in the morning on the steamer Cabrillo, after being taken to East San Pedro over the Salt Lake road on a train furnished by that company, and those that desire may return on the boat the same evening, or if they wish to stay over Sunday, or longer, they are invited to do so and return transportation will be given them.

In connection with these trips, I wish to announce now, that what is known as the Appliance Association, an auxiliary organization connected with and working with the Association of Railway Telegraph Superintendents, have arranged to take care of the meals which we will have at Bristol Pier on Tuesday, Alpine Tavern on Wednesday, and at the Glenwood Mission Inn, Riverside, on Friday, as well as the noon meal at the Metropole Hotel at Avalon, Catalina Island.

I want to tell you all that, because it will show you that our friends have been very good to us on this occasion. It is most unfortunate that every active and associate member could not be present and participate in the pleasures of the various trips. I won't say too much about the trips in Southern California, because Mr. Joseph Scott has already tipped his hands about the native sons out here, but I do want to impress upon you the

advisability of staying over until Saturday in order to make the trip to Catalina Island. It is a most beautiful trip, and I know that it will be much enjoyed. We saved that to the last in order to keep you with us as long as possible.

Gentlemen, here is a package of regrets. If anyone wishes, I will let them go over and digest them. Most of them are pitiable. Some of the members are tied up on account of labor troubles, some on account of construction of telephone and telegraph lines, and some of the excuses are not as good as I would like to see—but the majority of them are all right; and I think that if we had had this meeting in May, as originally planned, we would have had three times the number of members present.

New York, June 15, 1910.

John L. Davis, Esq., President Association of Railway Telegraph Superintendents, Los Angeles, Cal.

My Dear Mr. Davis: I am sorry it was not possible to so time my recent visit to the Pacific Coast as to enable me to attend the annual meeting of your association and meet the members under such agreeable and interesting conditions.

I have not had an opportunity to prepare a paper on any especial subject, and I do not know that there is any particular topic which I would be disposed to select. Notwithstanding that they are constantly in a "railroad" environment and inevitably subject to strong influences from that side of the house, it is my observation that superintendents of telegraph are as a rule mindful of their obligations as joint employees and disposed to protect the telegraph company in their dual capacity as such, in the various questions which arise under the contracts, so there is not much to be said on that subject, although it is naturally one that is very important to us.

Your committee has, I believe, prepared a report on the subject of uniform rules for the delivery of messages addressed

to passengers on trains, embodying recommendations which seem well designed to dispose of this somewhat troublesome question on lines entirely satisfactory to us as well as in the interest of the traveling public and patrons of the telegraph company, and I trust that through the good offices of your association these rules will soon become standard throughout the country.

My long experience with the rank and file of telegraphers has convinced me that they are as a whole honest and loyal and far above the average in intelligence. The many prominent positions in the commercial world filled today by those who at one time or another worked the key is a confirmation of this opinion. In my administration of the affairs of this company I hope in time to bring about substantial benefits to our fellow-craftsmen. In order to do this I need your assistance and co-operation. I beg, therefore, to ask that you give us the benefit of your serious consideration and experience in building up and the proper handling of commercial business on the lines of your respective roads and make such suggestions, from time to time, as may occur to you in the interest of our service. I assure you that I shall at all times be glad to be of any assistance to you that I can.

I trust that the meeting will be a success in every way and a means of much enjoyment to visiting members, particularly such as have never before had the pleasure of a visit to Southern California at this the most delightful time of the year.

Yours very truly,

B. BROOKS,
General Manager.

Los Angeles, Cal., Feb. 23, 1910.

Mr. I. T. Dyer, Superintendent Telegraph.

Dear Sir: I am in receipt of your favor of the 17th inst., relative to annual convention of the Association of Railway Tel-

egraph Superintendents to be held in this city next **May**, for which I am obliged.

If there is anything I can do to help make this convention a success, please let me know.

Yours very truly,

T. C. PECK.

San Francisco, Cal., June 17, 1910.

Mr. I. T. Dyer, Acting President, Association of Railway Telegraph Superintendents, care San Pedro, Los Angeles & Salt Lake Railway Co., Los Angeles, Cal.

My Dear Mr. Dyer: I have your two letters of the 15th inst.

Knowing as I do, from a good many years' experience, what a tough time Superintendents of Telegraph have, it gives me much pleasure to contribute even in a small way to their happiness, and I am very glad to be able to extend to them the courtesies of our lines during the convention. The necessary instructions have been given.

I don't know of anything that would please me more than to be present and meet a lot of my old friends, but I do not see how it is possible for me to get away just at this time. I have arranged to have Mr. Elam Miller, our Transmission Engineer, go to Los Angeles and attend the convention. He can probably add something to my old friend Kissinger's remarks on the testing of telephone circuits. Now that the railroad companies are going into telephony, I think Mr. Miller might also give the boys some suggestions that will be of value to them.

With all best wishes, I am,

Yours very sincerely,

E. C. BRADLEY,

Vice-President and General Manager.

Los Angeles, June 18, 1910.

Mr. I. T. Dyer, Acting President, Railway Telegraph Superintendents, Los Angeles, Cal.

Dear Mr. Dyer: On behalf of the Pacific Telephone and Telegraph Company, I take pleasure in extending through you, to the Railway Superintendents, the free use of our lines during the convention, June 20-25.

Yours truly,

C. M. SEELEY,

Division Commercial Superintendent.

Los Angeles, Cal., June 15, 1910.

Mr. I. T. Dyer, Acting President, Association of Railway Telegraph Superintendents, Los Angeles, Cal.

Dear Sir: As the management of the Western Union Telegraph Co. is heartily in sympathy with the objects of your association and desires to extend some courtesy to the delegates to the annual convention to be held in this city June 20 to 25, I am instructed to offer them the privilege of our wires for their personal social messages during their stay in Los Angeles.

With personal regards and my best wishes for the success of the convention,

Yours very truly,

F. H. LAMB,

Superintendent.

Los Angeles, Cal., June 16, 1910.

I. T. Dyer, Superintendent of Telegraph, S. P., L. A. & S. L. Ry. Co., Los Angeles.

Dear Sir: This company will be glad to extend the usual courtesies in the way of free telegraphing to the delegates of the National Association of Railway Telegraph Superintendents on

all personal social messages while the convention is in session at Los Angeles.

Please advise us how the delegates may be identified.

Yours very truly,

C. L. LEWIS,
Superintendent.

Los Angeles, Cal., June 18, 1910.

Mr. I. T. Dyer, Chairman of Association of Railway Telegraph Superintendents, Los Angeles, Cal.

My Dear Mr. Dyer: Will you kindly extend our invitation to the Railway Telegraph Superintendents and their ladies to visit and inspect our automatic telephone exchange?

We believe that same, being the largest automatic system in use anywhere, is one of the sights of Los Angeles, and we think will be of interest to the members of the association.

If you will therefore set an hour we will have our attendants take specific pains in explaining the system to your members.

Yours very truly,

HOME TELEPHONE AND TELEGRAPH CO.,

L. W. KELLER, Engineer.

Los Angeles, Cal., June 20, 1910.

I. T. Dyer, Acting President Railway Telegraph Superintendents' Association.

My Dear Sir: It gives me great pleasure to extend to the members of the association the privilege of using our long distance toll lines free of charge during the period in which the convention is in session.

The badge issued to the members will be sufficient identification, and we will instruct all our operators at attending pay stations to recognize this badge.

We will also instruct the Alexandria Hotel to put through calls from any room by any member of the association.

Yours very truly,

U. S. LONG DISTANCE TEL. AND TEL. CO.,

C. H. TEMPLE, Manager.

Los Angeles, Cal., May 6, 1910.

Mr. I. T. Dyer, Superintendent Telegraph, S. P., L. A. & S. L. R. R., Pacific Electric Building, Los Angeles.

Dear Sir: The United Wireless Telegraph Company of New York begs to extend the courtesies of wireless service to all members of the Association of Railway Superintendents and their families during the annual convention to be held in this city June 20 to 24.

Yours very truly,

UNITED WIRELESS TELEGRAPH CO. OF NEW YORK,

By H. L. Bleakney, Local Manager.

Los Angeles, Cal., June 13, 1910.

Mr. I. T. Dyer, Superintendent of Telegraph, Salt Lake R. R. Co., Los Angeles, Cal.

Dear Sir: With reference to the conference recently held in your office regarding trip of the members of the Association of Railway Telegraph Superintendents to Mount Lowe, also their taking dinner at Alpine Tavern: I beg to enclose to you herewith menu which has been drawn up by Mr. H. B. Brown, manager of the Tavern. If my memory serves me right, this menu is much more extensive than the one submitted by the Bristol Pier management.

Mr. Munger, our general passenger agent, has also arranged with the Cawston Ostrich Farm for 15 cents per capita entrance at that place.

Will you kindly advise me as early as possible, the number of persons that will make the trip to Mount Lowe? This in order that I may arrange for train service, as well as notify the Tavern as to the number there will be for dinner.

Yours very truly,

A. E. ROOME.

MENU CARD FOR RAILWAY TELEGRAPHERS' DINNER.

Puree of Tomato with Crusts.

Ripe Olives. Mixed Pickles.

Grenadines of Sea Bass with Bearneise.

Pommes Chateau.

Braised Fillet of Beef Bordeaux. Champignons.

Mashed Potatoes. Pettit Pois.

Macedoine of Fruit aux Maraschino.

Roman Punch. Pettit Fours.

Cheese and Crackers.

Cafe Noir.

. \$1.00.

Los Angeles, Cal., June 16, 1910.

Dear Sir: Your favor of the 15th received. We shall distribute the fruit and flowers provided by the Chamber of Commerce to the guests' rooms and the convention hall, as you suggested.

It is also agreeable for you to use our library for your convention, and our banquet room for the exhibits. The banquet room, I presume, will not be at our disposal, however, until after Saturday, as the Freight Claim Agents may not conclude their business until then, but as soon as they are through will place it at your disposal.

Kindly let me know if I can be of any assistance to you, now or at any time during the convention.

With cordial regards, I am

Yours very truly,

S. J. WHITMORE.

To Mr. I. T. Dyer, Superintendent Telegraph, S. P., L. A. & S. L. R. R. Co., City.

San Francisco, Cal., Dec. 24, 1909.

Mr. F. S. Rawlins, Superintendent of Telegraph Building.

Dear Sir: You are authorized to say to the committee having in charge the annual convention of the Superintendents of Telegraph of the United States and Canada, which meets in Los Angeles on May 16, 1910, that the Southern Pacific Company will be glad to place our service at the command of these gentlemen upon that occasion. I hope you will arrange to personally look after their movements over our lines and advise us what, in your judgment, would be agreeable to them.

Yours truly,

E. E. CALVIN.

San Francisco, Cal., Feb. 11, 1910.

Mr. F. S. Rawlins, Superintendent Telegraph, Southern Pacific Company, San Francisco, Cal.

Dear Sir: I beg to acknowledge receipt of your favor of Dec. 31, 1909, with enclosure from General Manager Calvin. On behalf of the Association of Railway Telegraph Superintendents, I desire to heartily thank Mr. Calvin and yourself for your generous offer.

The matter of railroad and other excursions is to be considered at the next meeting of the local sub-committee on entertainment, and I am at this time unable to state just what favors we may desire to ask of the Southern Pacific Company, but I

shall be glad to advise you further regarding this as soon as the details of the program have been decided upon.

Respectfully,

Vice-President and Chairman of Committee on Entertainment
and Arrangements.

San Francisco, Cal., Dec. 31, 1909.

Mr. I. T. Dyer, Superintendent Telegraph, S. P., L. A. & S. L.
R. R., Los Angeles, Cal.

Dear Sir: I hand you herewith letter from General Manager Calvin, under date of 24th inst., placing the service of the Southern Pacific Company at the command of the Superintendents of Telegraph of the United States and Canada for their annual meeting in your city in May next.

If you will advise me when and in what manner our service will be acceptable, I will take pleasure in looking after the details.

Yours truly,

F. S. RAWLINS.

Los Angeles, Cal., June 20, 1910.

Mr. I. T. Dyer, Superintendent of Telegraph, S. P., L. A. &
S. L. Ry., Los Angeles, Cal.

Dear Sir: I have arranged with Mr. F. K. McCarver, publicity representative of the Abbot Kinney Company at Venice, to give to your guests free the Scenic Railway, Miniature Railway and Aquarium upon their arrival at Venice tomorrow. This was very nice in Mr. McCarver and I would thank you to address him personally on this subject, and oblige,

Yours truly,

D. W. PONTIUS.

Los Angeles, Cal., June 21, 1910.

Mr. I. T. Dyer, Superintendent of Telegraph, S. P., L. A. & S. L. Ry., Los Angeles, Cal.

Dear Mr. Dyer: I wish to report that the fruit and flowers promised by this organization for the members of the Association of Railway Telegraph Superintendents were delivered to the Alexandria Hotel in quantities sufficient to supply each and every delegate present. The Alexandria requested the privilege of distributing them, consequently we delivered them there for their attaches to handle. We trust the distribution was made satisfactorily. If not kindly command us and we will endeavor to make amends as far as possible.

Yours truly,

FRANK WIGGINS,

Secretary.

Copy of telegram:

The association, by unanimous vote, has instructed us to convey heartiest greetings and best wishes to you and yours, and to express its regret for your unavoidable absence.

GHEGAN,

CAMP,

SHELDON,

Committee.

Los Angeles, Cal., June 22, 1910.

Edward J. Hall, Chairman Executive Committee Western Union Telegraph Company, New York, N. Y.

I am instructed by President I. H. Dyer of the Association of Railroad Telegraph Superintendents to notify you of your election as an honorary member of this association.

F. H. VAN ETTEX,

Acting Secretary.

The Secretary will now read the Treasurer's report.

TREASURER'S REPORT.

RECEIPTS.

On hand June 23, 1909.....	\$ 20.00
Active:	
Fees and dues for 1908-09.....	10.00
Fees and dues for 1909-10.....	535.00
Fees and dues for 1910-11.....	67.50
Associate:	
Fees and dues for 1908-09.....	10.00
Fees and dues for 1909-10.....	270.00
Fees and dues for 1910-11.....	7.50
For advertisements	260.00
Total.....	<u>\$1,180.00</u>

EXPENDITURES.

Expense Entertainment Committee, Detroit meeting..	\$ 71.25
Reporting and printing minutes, Detroit meeting.....	384.05
Stationery, stamps, etc., President's office.....	71.55
Stationery, stamps, etc., Secretary's office.....	58.36
High Tension Committee, \$81.89, less received for ads, \$45.00	36.89
Printing Eastern Division Meetings, \$71.85, less re- ceived for ads, \$45.00.....	26.85
Printing Western Division Meetings, \$48.70, less re- ceived for ads, \$45.00.....	3.70
Stenographer, Ex. Com. meeting, Chicago.....	11.85
Printing circulars and attendance cards.....	20.50
Badges for Los Angeles meeting.....	80.00
Secretary's salary	300.00
Cash on hand.....	<u>115.00</u>
Total.....	<u>\$1,180.00</u>

Respectfully,

P. W. DREW,
Secretary and Treasurer.

The Secretary: Now, the next thing will be voting on new members.

Mr. Camp: The motion next in order is accepting the report of the Treasurer, isn't it?

Moved and seconded that the Treasurer's report be accepted.

The President: Gentlemen, it has been moved and seconded that the report of the Treasurer be accepted. All in favor will signify it by saying aye. Contrary, no. Passed.

If there are any applications to be put in, now is a good time to do it.

The Secretary: Yes, if there are any more applications to come in, we would like to have them now. Applications should be made to the Secretary. I will read the list that I have here of names to be voted on as active members of this association.

Chicago, Ill., June 10, 1910.

New members to be voted upon at opening session of annual meeting:

ACTIVE.

F. S. Work, chief dispatcher, L. & H. R. Ry., Warwick, N. Y.

H. L. Chace, assistant Supt. Tel., A. T. & S. F., Los Angeles, Cal.

J. H. Lindsey, Supt. Tel., Northern Ry., Costa Rica, Central America.

J. Wilson, Supt. Tel., C. P. R., Vancouver, B. C.

E. D. Hubbard, general foreman, G. T. Ry., Battle Creek, Mich.

J. F. Caskey, Supt. Tel., L. V. R. R., South Bethlehem, Pa.

E. W. Mason, Supt. Tel., Western Pac. Ry., San Francisco, Cal.

C. T. Day, assistant Supt. Tel., Sou. Pac., Empalme, Sonora, Mexico.

G. H. Leverett, Tel. and Tel. Engineer, C. M. & P. S., Seattle, Wash.

J. C. Johnson, Supt. Tel., Penna. R. R., Philadelphia, Pa.

George J. Bayliss, general foreman, Sou. Pac., San Francisco, Cal.

W. M. Knoud, telegraph manager, G. C. & S. F. Ry., Galveston, Tex.

George N. MacDonald, signal engineer, Virginian Ry., Norfolk, Va.

J. W. Murphy, Supt. Tel., M. & O. R. R., Jackson, Tenn.

T. M. Haston, Supt. Tel., T., St. L. & W., Bloomington, Ill.

A. T. Hollenbeck, Supt. Tel., C. G. W., Chicago, Ill.

J. T. Nolan, chief operator Wash. Terminal Co., Washington, D. C.

H. L. Husted, division operator, W. J. & S. R. R., Camden, N. J.

W. F. Taylor, C. P. C. and division operator, Penna. R. R., Altoona, Pa.

J. H. Ditch, telegraph inspector, Penna. R. R., Altoona, Pa.

E. C. Keenan, Supt. Tel., L. S. & M. S., Toledo, O.

F. J. Mahon, Supt. Tel., C. P. R., St. John, N. B.

D. W. Mersereau, Supt. Constr., C. P. R., St. John, N. B.

W. H. Hall, Supt. Tel., M., K. & T., Denison, Tex.

P. Robinson, C. T. D. Algoma Cent. & H. B. Ry., Sault Ste. Marie, Mich.

W. S. Fender, Asst. Supt. Tel., Sou. Pac. Ry., San Francisco, Cal.

ASSOCIATE MEMBERS.

E. L. Marshall, engineer, etc., National Carbon Co., Cleveland, O.

C. H. Fuller, Com'l Supt., A. T. & T. Co., New York, N. Y.

G. W. Peck, Com'l Dept., A. T. & T. Co., New York, N. Y.

Frank R. Chambers, Jr., V. P., Duplex Metals Co., New York, N. Y.

W. M. Page, manager Duplex Metals Co., New York, N. Y.

H. D. Currier, engineer, Duplex Metals Co., New York, N. Y.

R. A. Peterson, V. P., Watson Ins. Wire Co., Chicago, Ill.

P. J. Eubanks, sales manager, Sandwich Elec. Co., Sandwich, Ill.

L. H. Kinnard, Bell Tel. Co. of Pa., Philadelphia, Pa.

A. F. Ormsbee, special agent, N. Y. Tel. Co., Brooklyn, N. Y.

Wm. Prescott Hunt, Jr., V. P. and secretary, The Buda Co., Chicago.

G. W. Swan, John A. Roebling's Sons Co., New York, N. Y.

C. N. Sigison, U. S. Electric Co., New York, N. Y.

Russell W. Gillette, electrician, Pac. Div., W. U. Tel Co., San Francisco, Cal.

The President: Is there anyone present who has names he wishes to present?

The President: Gentlemen, we are working under the new constitution and by-laws, and I must admit that I am not familiar with all of the little requirements and the rules governing our action. But you have heard the reading of the list of names here, and I will now entertain a motion to permit the Secretary to cast a ballot for the election of the applicants contained in that statement just read.

Mr. Griffith: I move that the Secretary be instructed to cast the ballot for the election of the applicants for active membership in this association.

Mr. Bennett: Speaking to that motion, I will say that perhaps we had better read these new provisions of the constitution, so we will all understand just what we are doing. My understanding is that those names that have just been read to you, have made written application to the Secretary and this written application had been approved by the Executive Committee. Under the constitutional procedure the next act is to vote by ballot. Seven negative votes exclude from membership. Now, I think it would be necessary to amend Mr. Griffith's motion and suspend the rules and instruct the Secretary to cast the

ballot of the association. If you don't do that, it is not following the rules laid down, and possibly that would not be parliamentary, because this is a constitutional provision.

Mr. Camp: I don't think that would be constitutional, because it requires a change of the constitutional provisions. But we might do this, though, vote for the whole lot by one ballot; let one ballot be taken.

The President: If Mr. Griffith will withdraw his motion we will proceed to ballot for the names as read by one ballot.

Mr. Griffith: The constitution says that they shall be elected by ballot. The motion to have the Secretary cast that ballot is in order. It does not say ballots, it says ballot.

Mr. Bennett: Mr. Chairman, I hardly think that is a proper constitutional procedure, although it would suit me very well, as being a time saving. We have never yet had any trouble and I hope we never shall have any negative votes here, but some members might have a good reason for voting in the negative, and seven negative votes cast would exclude from membership. Now, if the Secretary casts one ballot for the association for all of these names, why you can't reject one without rejecting all, or take one without taking all. If there is no objection to that sort of an arrangement, and it is constitutional, I have nothing further to say.

Mr. Griffith: I withdraw the motion.

Mr. Camp: I move that one ballot be cast for the proposed names *en block*. Let the one ballot be taken, then if there are seven negative votes we shall have to ballot for each one individually, but we can ballot for the whole of the names *en block*, according to the regular practice.

Mr. Bennett: I would second Mr. Camp's motion, if I may speak to that motion now. We may vote with this understanding, that everybody casts a paper ballot, understanding that the vote

is for all of the names of all of the applicants. If there were such a result as the rejection of any certain applicant, then the member desiring to reject, should vote "No" on the whole ballot, and as a consequence we would have to ballot name by name, but in case all vote unanimously and affirmatively, that would end the matter, and these applicants would be admitted.

The Secretary: Only active members, now, vote on these candidates.

The President: Gentlemen, you have heard the motion. All in favor will signify it by saying aye. Contrary, no. The ayes have it.

Will the active members please rise, so I can take a look at them and size them up? Nineteen. Thank you.

Ballots passed, collected and canvassed.

The President: Gentlemen, it is unanimous, therefore the gentlemen whose names were read are elected members of this association, active members.

Mr. Camp: What is the total number of new members?

The President: Nineteen new members.

The Secretary: The next are associate members. I will read the list I have here.

The Secretary: Now, that completes the number that has been approved by the Executive Committee. There are a few more names, but until we complete our Executive Committee we will have to hold those over.

The President: Gentlemen, we will handle these in the same manner as we did the others. Will someone please make a motion that this be done?

Mr. Camp: I move, Mr. President, that one ballot be cast for the names as read out by the Secretary, *en block*.

The Secretary: I wish to add to that same list the names of G. W. Swan and S. M. Sigison. I don't know whether there are any others here for associate members or not. It may be possible that there are. Please include the last names read, in the list first given.

The President: Gentlemen, you have heard the motion. Those in favor of it will signify it by saying aye. Contrary, no. Passed.

Ballots passed, collected and canvassed.

The President: Twenty-three votes, all favorable, which shows that you have elected the members named as associate members of this association.

The Secretary: Now, Mr. President, we have a list of those proposed for honorary membership, the following list, which I will read.

FOR HONORARY MEMBERSHIP.

J. F. Fisher, Ex-Supt. Tel., Penna. Co.

G. H. Groce, Ex-Supt. Tel., Ill. Central.

S. K. Bullard, Ex-Supt. Tel., M., K. & T. Ry.

Wm Kline, Ex-Supt. Tel., L. S. & M. S.

John L. Davis, Ex-Supt. Tel., C. & E. Ill. Ry.

E. E. Torrey, Ex-Supt. Tel., Mob. & Ohio.

W. T. Gentry, president, Southern Bell T. and T. Co., San Francisco, Cal.

Edward J. Hall, chairman executive committee, W. U. Tel. Co., New York.

E. C. Bradley, vice president and general manager, Pacific Tel. and Tel. Co., San Francisco, Cal.

The President: Mr. Bennett will please read the laws governing the admission of honorary members.

Mr. Bennett: (Reads:) "Honorary membership may be conferred upon those who have attained eminence in the tele-

graph, telephone or other electrical service, or who have in any manner contributed to the success of this association."

The President: In handling this matter it will be necessary for the vote to be unanimous to elect the honorary members.

Mr. Walstrum: I wish to ask if the application must be made for honorary membership?

The President: No, it does not say that application must be made.

Mr. Walstrum: If not, I would like to add a name or two to that list.

The Secretary: These names just read on the honorary membership list have been approved by the Executive Committee. All applications must be approved by that committee, so if there are any new names to be added to this list, you will have to report the same to the President, and the Executive Committee probably will act on them, or we can carry it out later on. These have all been approved.

Mr. Griffith: Two applications will be ready in one moment.

The President: The only difficulty about that, Mr. Griffith, is that it is necessary to have these applications approved by the Executive Committee.

Mr. Walstrum: The Executive Committee is here, as I understand it, to do it.

The Secretary: If there is a quorum of them here we can get the names and then vote on them.

Mr. Walstrum: Mr. President, here are two more names to add to the honorary list: Mr. W. T. Gentry, president Southern Bell Telephone and Telegraph Company, and Edward J. Hall, chairman of the executive committee of the Western Union Telegraph Company. Mr. E. C. Bradely, general manager and vice president of the Pacific Telephone and Telegraph Company -

The Secretary: That completes the list of honorary members; it makes nine new honorary members.

The President: We will vote on these in the same manner as the others. If there is no opposition we will pass it; if there is, then we will vote on each name separately. We will proceed with the balloting.

Ballots passed, collected and canvassed.

The President: The same as last time—unanimous. Twenty-three votes. The gentlemen named have been elected honorary members of this association. The Secretary will notify them accordingly. Gentlemen, you will please prepare your ballots for the election of one more associate member, Mr. Russell W. Gillette.

Ballots passed, collected and canvassed.

The President: Gentlemen, you have elected Mr. Gillette an associate member of this association by a unanimous vote.

Mr. Gillette: Will Mr. Gillette please rise?

A Member: He has just gone out on some business.

The President: The next order of business is the report of the Executive Committee. I think I can take advantage of this time to report to the association the resignation of the President, Mr. John L. Davis, which, of course, created a vacancy on the Executive Committee. In order to properly conduct the business of the association, as the acting President I appointed, with the approval of the Executive Committee, Mr. George A. Cellar of the Pennsylvania Railroad as First Vice-President, and Mr. John B. Sheldon of the Union Pacific as Second Vice-President, to fill those offices for the unexpired term. I might add further, also, that in electing your Secretary and Treasurer, which also carries with it the office of member of the Executive Committee, it will enable us to perform the necessary duties of

that committee. If any member of the Executive Committee has any report to make, we would be glad to hear from you at this time. Mr. Bennett?

Mr. Bennett: I have nothing to report.

The President: Mr. Sheldon?

Mr. Sheldon: Nothing to report.

The President: Mr. Secretary?

The Secretary: I have nothing.

The President: The next order of business is the report of the standing committees. In connection with the report of the standing committees, I want to announce that the local members of the American Institute of Electrical Engineers are very much interested in the high tension wire crossing paper. I have distributed many copies among the officers and chief electricians of the various power companies along the coast and in Utah, and I am very pleased to note the interest they manifest, and I find that instead of opposing the scheme of a uniform standard they are very much in favor of it, and I believe that we will secure much assistance from that institute. The members, as many of them as can, and also some friends of ours with the telephone company at San Francisco, will attend the special meeting Thursday evening, the 23d, at 7:30 P. M., in this convention room. The only business to be transacted at that time, of course, will be the high tension wire crossing proposition. Mr. Bennett, in the absence of our good friend, Cellars, who found it impossible to attend this meeting, will have charge of this discussion, and I feel sure will place our side of it before these gentlemen in a very satisfactory manner. I should be glad to have a full attendance at that meeting on the part of the active members, especially, and should also very much like to have the associate members present. They are interested, also.

Is there any other standing committee to report, Mr. Secretary?

The Secretary: The Topics Committee.

The President: We should have a report from the Auditing Committee on this Treasurer's report. Is Mr. A. B. Taylor or Mr. F. G. Sherman present?

A Member: No.

The President: The report of the Auditing Committee is not ready; it will be presented later. Mr. Sheldon, chairman of the Topics Committee, I believe you have a report.

Mr. Sheldon: I will ask Mr. Bennett to read it.

Mr. Bennett: Here is the report of the Topics Committee. J. B. Sheldon, chairman. (Reads:)

REPORT OF TOPICS COMMITTEE.

Mr. President: It is my pleasure to submit a brief report on what the Topics Committee has accomplished for this convention, and trust I shall not be misunderstood when asserting that the task has been arduous, on account of so little accomplished after the amount of time and labor spent in trying to accomplish something in which our members are vitally interested.

The papers to be submitted at the meeting are not as many as previously made known, however. We trust the quality will make up for what is lacking in quantity.

The subject of "Wireless Telegraphy," which was to have been handled by Mr. William Maver, Jr., of New York upon special request, and Mr. Dildine's paper on "Telephone Train Dispatching" are not forthcoming, which I am sorry to say. Both gentlemen advised at a late date that the subjects have been thoroughly covered from time to time and that would be at a loss to give anything new and of interest to this association.

Mr. Dildine requested that a paper delivered by myself before the Omaha Railroad Club in March be substituted in lieu thereof. This, of course, must be considered by the association, as the paper in question has already been published in the Telegraph and Telephone Age, and I would not care to reproduce it without due consideration.

I regret very much that the papers which have been prepared for this meeting were not filed in time for print, as per our by-laws. This is a matter almost beyond the committee's reach.

Another fact which is to be regretted is the non-attendance of some of the gentlemen who have given us the benefit of their vast experiences in writing and cannot be present with us today to handle their subjects in person.

The thanks of this association are due to the gentlemen who so kindly contributed to the success of this meeting, notwithstanding the fact they are absent, and that their papers will be delivered in just as able a manner as is possible.

J. B. SHELDON.

Chairman Topics Committee.

The President: Gentlemen, you have heard the report of the Topics Committee. It is most unfortunate that some of those that were expected to present papers fell down at the last moment, for the reason that there are many others who would have been glad to have presented papers, had they been permitted to do so. I personally offered the chairman of the Topics Committee a paper, which he was obliged to turn down, owing to the fact that he already had a sufficient number. I think, however, we have enough to give us ample work at this convention. Any remarks on this report? Mr. Sheldon, do you wish to make any verbal remarks?

Mr. Sheldon: No, sir.

Mr. Bennett: I move that the report of the Topics Committee be accepted.

Motion seconded and carried.

The President: Reverting back to the matter of the high tension wire crossing report, I told you that we are to have a meeting Thursday night for the purpose of considering this subject, and I will be glad to have a few words from Mr. Bennett now as to what that meeting expects to do.

Mr. Bennett: I think that I am the only active member present who is a member of the special committee on high tension wire crossings. Mr. Groce was a member of the committee, and an active member, and I have no doubt he would be glad to be present on Thursday evening at 7:30 to discuss the matter with the rest of us, and I will do what I can to make the meeting interesting, but I am afraid I won't carry out fully your expectations. I will do the best I can do, however. There is no formal report, so far as I know, of this committee. But Mr. Cellar and I were at Lansing, Mich., before the Railroad Commissioners a month or two ago, where we had a discussion of the subject in connection with the revision of the specifications which the Railway Commission imposed upon all who would make a high tension wire crossing over a track or railway. We had a very satisfactory meeting with that Railroad Commission and at the conclusion of it they abandoned the requirement of basket netting for the protection of wires beneath, which had before that been one of their most urgent requirements. And then we got a representative of a power company of the state of Michigan, who had responded to the invitation of the committee to be present at this meeting, to think he wanted to do away with it, as also did all the organizations represented at that meeting. So we have accomplished something in the state of Michigan.

I will submit that, Mr. Chairman, in lieu of any formal report on the part of the committee, and I hope that we may have as full a discussion as possible on Thursday evening.

The President: Are there any other standing committees to report at this time?

Mr. Camp: Before we pass from that subject, I might say that I have copies, spare copies, with me of the standard specifications of the Canadian Railway Board, and any of the members who wish to obtain any of these copies before Thursday, just let me know and I will furnish them.

The President: Gentlemen, anyone who is interested in that subject will be furnished with a copy of the report of the Railway Commission.

Mr. Camp: The report of the Canadian Board of Railway Commissioners will be furnished to anyone that wishes, for their use.

The President: I should like to have three or four copies for my personal use, for distribution.

The Secretary: Here is the report of Secretary Drew. (Reads:)

Chicago, Ill., June 8, 1910.

No deaths of members have been reported during the year.

We have lost several members who have been active in the work of the association, namely, J. B. Fisher of the Penna. Co.; John L. Davis of the C. & E. Ill.; G. H. Groce of the Ill. Central; S. K. Bullard of the M., K. & T.; Wm. Kline of the L. S. & M. S. The two last named on account of ill health, the others by promotion or engaging in other branches of business.

Yours truly,

P. W. DREW,
Secretary.

The President: Gentlemen, you have heard the report of the Secretary. If you have no remarks we will pass that subject. What have you got along the line of special business?

Mr. Griffith, you are on the Committee on Resolutions. Have you anything to say at this time?

Mr. Griffith: I think not at the present time.

The President: Now, the next thing is unfinished business.

The Secretary: I don't see anything here under the head of unfinished business. There is nothing to consider at the present time, though some of these reports may be considered later on. Here is a report from Mr. E. A. Chenery, a member of this association, which I will read to the President and members.

COMMITTEE REPORT.

Read by Mr. Van Etten.

St. Louis, Mo., June 11, 1910.

Mr. I. T. Dyer, Superintendent Telegraph, S. P., L. A. & S. L. Railway, Los Angeles, Cal.

Mr. Dear Mr. Dyer: I am attaching hereto a report of the two meetings held by the Western division during the past year, which I had hoped to present personally.

Up to the last minute I have been in hopes that I could attend the convention, but owing to the situation held by our negotiations with the telegraphers have resulted in the matter being submitted to arbitration and the hearing expected at any time, it is absolutely impossible for me to get away. This is a disappointment that I shall always feel, for the reason that, never having been west of the Rocky Mountains, I have looked forward to the coming convention with a great deal of pleasure in anticipation of seeing that section of the country and renewing friendships with so many of the good members.

I have prevailed upon my wife and son to make the trip without me, and, while our association in no event deals with the suffragette question, I have not attempted to induce the "missus" to speak for either one of us on the floor, I shall feel that I am at least well represented. I trust you will understand the situation fully and express my sincere regrets to the good members present who are more fortunate than I am.

Yours truly,

E. A. CHENERY,
Superintendent Telegraph.

The President and Members, Association of Railway Telegraph Superintendents.

Gentlemen: In conformance with the by-laws, the Western Division of this Association held two meetings during the past year, as follows:

At Chicago, in the office of President Davis, on Sept. 28, 1909, at which were present twenty-five active and seven associate members and seven visitors, a total of thirty-nine.

Discussion was had on the matter of high tension crossings and steps taken to induce the adoption of the proposed contract to cover.

The proposed form of contract to be presented by the American Telegraph and Telephone Company, as outlined at our last annual convention, was also fully discussed. Mr. F. A. Baker of the telephone company explaining in detail the various features.

The second meeting was held at Chicago, in the office of Superintendent Bennett on Jan. 19, 1910, there being present twenty-two active and five associate members and five visitors, a total of thirty-two.

Discussion on the two subjects taken up at the previous meeting was continued and progress reports made.

Features connected with the annual convention were fully discussed, the report from Mr. Dyer, of the arrangements under way, being read, and the untiring effort of this valuable member on behalf of our association strongly commended.

The minutes of the above named meetings, together with a report of the Committee on High Tension Wire Crossings, dated Dec. 22, 1909, have been printed and distributed to members.

A statement of the secretary of the Western Division is attached hereto, showing the total expense in excess of the amount received from advertising to have been \$3.70, and the amount has been covered by Secretary Drew.

It may not be out of place at this time to say, in the opinion of the undersigned, that the two meetings, in addition to the annual convention, as provided for in the by-laws, are conducive of much good in bringing the members together for an exchange of ideas. A closer acquaintance tends to create confidence, the avenue for the exchange of new and progressive thoughts is broadened, and the service, as well as the individual, is benefited.

That the work of the association is being recognized by the managing officials of our railways is well understood, and each member as a unit can further advance his own interests and the welfare of the road he represents by attending the meetings and taking part in the discussions.

The many subjects, including the uniform method of handling and expediting commercial business, from its origin to the close of the reports, line and service maintenance, wire crossings, telegraph and telephone practices, office standards, labor schedules and statistics, files, personal and other records, and the many details in connection therewith, is but a fragment of the matters that daily present some new feature regarding which each member is always ready to welcome an expression from his co-laborer. These subjects, while old, are always of interest,

and if continually brought before our minds, may be of renewed interest.

That our organization can increase its efficiency by frequent discussions of these and other matters of interest, no one will dispute; and our meetings should be had with that end in view, introducing such new subjects and giving them the fullest discussion, in order to keep abreast of the times.

Respectfully submitted,

E. A. CHENERY,

Chairman Western Division.

St. Louis, June 9, 1910.

ASSOCIATION OF RAILWAY TELEGRAPH SUPER- INTENDENTS.

WESTERN DIVISION.

St. Louis, Mo., June 1, 1910.

RECEIPTS.

For advertising in Western Division proceedings, Sept.
28, 1909:

Standard Underground Cable Co.....	\$15.00
American Telephone and Telegraph Co.....	15.00
Western Electric Co.....	15.00
	<hr/>
	\$45.00

DISBURSEMENTS.

J. W. Steele & Co., postals and printing notice of meeting Sept. 28, 1909.....	\$ 2.50
J. W. Steele & Co., 300 copies proceedings of September meeting and 150 envelopes.....	31.50
E. A. Chenery, postage.....	2.00
F. E. Bentley, postage, Circular Oct. 11.....	1.00
F. E. Bentley, postage, proceedings, Nov. 1.....	2.00
F. E. Bentley, postage, Circular Nov. 11.....	1.00
Stenographer's services and getting out minutes of January meeting, including postage.....	6.70
F. E. Bentley, postage, Circular Feb. 1.....	1.00
F. E. Bentley, postage, Circular Feb. 22.....	1.00
	<hr/>
	\$48.70

Received check Feb. 28, from Secretary Drew for deficit of\$ 3.70

F. E. BENTLEY,

Secretary, Western Division.

Approved:

E. A. CHENERY, Chairman.

The President: Gentlemen, you have heard the very interesting report from Mr. Chenery, chairman of the Western Division. Are there any remarks? If not, we will pass it.

Gentlemen, we will take up the matter of the new business, the reading of papers and discussion. I will call on Mr. Sheldon of the Topics Committee to present whatever he may have.

Mr. Sheldon: I would be pleased to call on Mr. Williams for his paper on the "Composite Telephone Blocking System."

COMPOSITE TELEPHONE BLOCKING.

Read by Mr. Williams.

The Seaboard Air Line Railway has been blocking its trains by telephone over one of its most congested districts, a distance of 154 miles, for four years, using an iron wire solely for this purpose with one telephone, two bells (one bell for north block and one for south block) and a switching key arrangement at each station. This circuit proved so successful that a little more than two years ago we were called upon to extend the telephonic block 53 miles south to be operated under the same conditions, i. e., one telephone at each station with bells or howlers, north and south, and a switching key arrangement to throw the telephone over on the north or south block, as occasion would require.

Not having a spare wire available to do this, and wishing to avoid the expense of stringing one, we selected a circuit 175 miles long with thirty-five telegraph stations thereon and composited an intermediate fifty-three miles. On the fifty-three mile stretch are located ten intermediate telegraph stations and eleven telephone stations, both operated simultaneously. The telegraph circuit works as well now as it did before, and while we know there is lag, we have not discovered it in operation. The scheme has been a success from the first. This has been very gratifying, because the iron wire that makes up this circuit has been in service for about forty years, and it would not be unnatural to expect some bad effects from this on the telegraph service. As a matter of fact, there has been no failure on this circuit since the telephone equipment was added to it, two or more years ago. The transmission obtained is perfect.

The line is composited in such a way that each station can call only the two adjacent stations, one north and one south, without calling any other station. The method of accomplishing this is shown on the attached blue print. It will be noticed

that at each station a portion of the windings of two repeating coils are cut into the telegraph line and that the composited telephone sets are wired from the secondaries of these. These coils are for the purpose of reducing noise on the line and preventing interference between the telephone and Morse circuits. Whenever one wire is to be used for simultaneous telephony and telegraphy it becomes necessary to provide some means of preventing the telephone currents from passing off over the telegraph lines and thereby reducing the transmission of speech in the telephone. This is ordinarily accomplished by the use of a retardation coil connected in series in the telegraph line.

The retardation coil offers a high impedance to the high frequency telephone currents (approximately 1,000 P. P. S.), thereby preventing them from passing through to the next station, but because of the low resistance to direct current telegraph impulses allows the telegraph currents to pass on.

The condensers wired from the coil to ground are for the purpose of preventing telegraph currents being diverted from the line to ground.

The No. 25A and No. 27A Western Electric repeating coils are used in a similar capacity in the case of the Seaboard Air Line and have the additional advantage of being cheaper to install.

Retardation coils usually employed are used purposely to choke out the telephone currents, whereas in the Seaboard circuits this is not accomplished by the repeating coil alone, but also by the telegraph relay which has a high impedance.

These repeating coils have shown up most satisfactorily for block service, where it is not of tremendous importance if the conversation in one block can be indistinctly heard one or two blocks away. By this it is not meant that conversation in blocks adjacent to the one in use is interfered with; it is not, but if the

line is quiet, conversation one or two blocks away can be faintly distinguished.

Telephone signalling is accomplished in block work in the same way as with the ordinary composite set. The operator wishing to call the adjacent block presses a button in the set, which places high frequency current on the line by means of an interrupter and induction coil.

The current at the signalled station passes through a condenser and howler to ground, causing the howler to produce a sufficiently loud sound to be heard in the station.

Block wire compositing differs from the ordinary through composited line in that it is only necessary to be able to talk to the two adjacent blocks on either side of a tower or station at the utmost; ordinarily any operator does not talk over more than one block on either side of him. This is one reason which made it possible in our case to omit some of the apparatus usually necessary and to use repeating coils in order to divide the line into blocks. The condenser and resistance usually bridged around the telegraph keys on a composited line are omitted because a by-path around these keys is not required. In no case in block work is it ever necessary to signal telephonically past a telegraph relay.

There are two causes of trouble to be considered in reference to the telegraph circuit:

(a) Drag, i. e., decrease in speed of telegraph signalling.

(b) Interference of telephone signalling current with the telegraph line relays.

The increased load of the line occasioned by the introduction of No. 27A repeating coils and one-half microfarad condensers to ground at each station, is not sufficient to cause any perceptible drag on the telegraph circuit.

The high frequency telephone signalling circuit from the in-

duction coil does not interfere with the operation of the line relays at all.

In reference to the telephone circuits the following things must be considered:

- (a) Morse thump.
- (b) Interference with conversation on any block in the circuit by telephone signalling current in any other block.
- (c) Interference with conversation on any block in the circuit by cross-talk from conversation on any other block.

The Morse thump is at no time of sufficient intensity to be disagreeable or to interfere with the talking circuit. The howlers we are at present using are being operated on four cells of dry battery and are unnecessarily loud. These will be reduced, as under ordinary conditions two or three cells are sufficient to secure good signalling.

If it is desired to cut out one or more stations at night or extend the block during light load periods, this can be done and the two blocks on either side thrown together for operating purposes. It simply becomes necessary to short circuit the apparatus (both telephone and telegraph) of the way station being cut out. On the Seaboard this is done by a small knife switch in the telephone ground to prevent a possible leakage and the wire cut out at the telegraph switchboard.

The electrical features of the telephone blocking scheme have been given in some detail above. This is in order that a fairly clear idea may be obtained as to just how the equipment is operated and the simplicity of it for the purpose. It operates with us under very severe conditions, namely, the heavy load of telegraph stations along the line. If these could be cut out, and in many cases this would be possible, the grade of service would be equal to much of that obtainable today either in commercial or train dispatching service. The wire could still be used for

through telegraph business and undoubtedly would be so used, the advent of the telephone merely making it possible to do without the local telegraph stations.

It is not necessary to go into the advantages of this method of blocking. The same arguments apply to it as to the case of dispatching trains by telephone, and railroad men are becoming thoroughly acquainted with those. The greater speed of operation obtainable, the advantages of direct personal communication between the operators, the quicker response to the sound of a howler or a bell than to the telegraph sounder, all these work for better efficiency and therefore better service.

There is another and an important advantage of this system of blocking. It enables a railroad to get 100 per cent more service out of existing block wires. A railroad can change over a block wire telegraph line to a through circuit while at the same time operating the blocks as efficiently, if not more so, than before. For this reason it seems worth while bringing the advantages of this system before the Association of Railway Telegraph Superintendents, in order that, when necessity for its adoption arises, it will stand as a ready solution of a problem which otherwise might prove both complicated and expensive.

W. F. WILLIAMS.

The President: Gentlemen, you have heard the very interesting paper just read by Mr. Williams. We should be glad to have any remarks on the paper, or any discussion that may suggest itself to you.

Mr. Williams: In preparing that paper I did not expect the paper to be discussed. I simply brought it to give the association the advantage of just our experience in that line of service.

The President: You have the thanks of the association, Mr. Williams.

We are to have a very interesting paper to be read by Mr. E. P. Griffith of the Erie Railroad on the "Delivery of Commercial Messages to Passenger Trains," and it will be exceedingly interesting, not only to the members of this association, but also to the telephone and telegraph companies who handle telegrams for delivery in that manner. We will put this down, then, for tomorrow morning, Mr. Griffith, with your permission.

Mr. Sheldon: We have another paper here by Mr. H. P. Rynier, entitled, "The Hoeschen Batteryless Signal System." It is a short paper. I have also some prints accompanying it, showing the operation of the batteryless system and some photographs of the system, and will submit them for the inspection of the gentlemen present. I would be pleased to have Mr. Bennett read the paper and submit the blue prints and documents which accompany the paper for the inspection of the gentlemen present. It is a very interesting subject, in which we are all concerned.

THE HOESCHEN BATTERYLESS SIGNAL SYSTEM.

The Hoeschen magneto mechanical devices, as applied to railway signals, have developed into one of the most interesting of modern automatic railway signal systems and is attracting the attention of operating officials of both steam and electric railroads throughout the United States, Canada and Mexico.

About twenty years ago Mr. L. H. Korty, then Superintendent of Telegraph of the Union Pacific Railroad Company, placed with Mr. Hoeschen, an expert mechanic and electrician of Omaha, Neb., several orders for highway crossing bells of the ordinary battery type.

During the construction and installation of these bells Mr. Hoeschen was impressed with the high cost of maintenance due to the frequent renewal of batteries and consequent skilled attention necessary to keep this type of bell in proper working con-

dition, and in this manner became deeply interested in the development and improvement of railroad signals in general.

In 1896 Mr. Hoeschen designed and patented the first batteryless crossing bell, and after a series of long and thorough experiments with this bell he finally perfected it in every detail, and its installation was authorized by the C., B. & Q. R. R. Co. in December, 1905. It has been in continual service since that time and the Burlington Railroad advise that during the past twenty-two months the outlay for its maintenance has been only \$11. This bell has required no repairs nor replacements and has proven its absolute reliability in being entirely free from failures, even under the worst weather conditions. Additional installations on the Burlington, Union Pacific, Illinois Central and other roads have proven conclusively that the remarkably low cost of maintenance, as stated above, is high as compared with more recent installations, which, no doubt, is largely due to less frequent inspections by the signal maintainers.

The most striking feature of the Hoeschen system is its operation by electro-mechanical means which are entirely independent of batteries, track circuits or other methods requiring delicate apparatus.

The motive power used to operate the crossing bell, semaphores and annunciators is obtained by the depression of the rail. This source of power being absolutely reliable, insures against failures or false signals.

Hoeschen magneto-mechanical generators are required in connection with the operation of the crossing bell, annunciators, speed indicators, etc. Two generators are used in connection with an ordinary single or double track crossing bell installation, a generator being placed at the desired distance each way from the crossing. This device consists of two levers with their inner ends resting against the under side of the rail and fulcrumed close to it. Their outer ends terminating adjacent to a

releasing rod used in connection with an armature resting on the cores of a pair of induction coils, which are fastened to the poles of a group of permanent magnets. When a train is going toward the crossing a slight depression of the rail above the operating lever causes the outer end of this lever to lift the armature from the induction coils. This induces a momentary current which is transmitted by means of a metallic circuit to the releasing magnets controlling the bell motor, causing the bell to ring until the train reaches the crossing. A train passing in the opposite direction will depress the rail above the shunt lever first, thus causing the outer end of this lever to shift the releasing rod away from the armature, so that the depression of the operating lever immediately following has no actuating effect.

The spring motor used to operate the bell is completely enclosed in the metal cylinder. This motor is compactly built, and the few parts required for its construction consist of a simple gear movement of three wheels used in connection with three powerful motor springs. These springs are secured to the main driving shaft of the motor and are wound by means of a rod connected directly with a lever resting against the under side of the rail at a point opposite the motor. When the rail at this point is depressed by the wheel of each car of a passing train, a reciprocating motion of the winding rod is obtained, thus winding the springs and restoring the releasing lever controlling the motor; means being provided to prevent over-winding.

When the motor is released (by an approaching train passing over the generator) it actuates a pendulum bell hammer, which at regular intervals strikes alternately the inner sides of a loud sounding locomotive type of bell at the rate of 200 strokes per minute until the train reaches the crossing.

A modified type of this motor has recently been installed in a number of places in place of the electric motor in semaphore block signals, and its general use at an early date is predicted for this class of service.

The President: Gentlemen, you have heard the paper just read. What is your pleasure? The Secretary will file it.

Mr. Bennett: Those who would like to inspect these prints will find them on the desk here.

The President: These prints will be on the desk for the use of anyone interested, and we will be glad to have you look them over. It is a new scheme and is interesting. If it may be permitted, I would like to go back to this talk of courtesies extended, and if there is no objection that the minutes may be arranged to contain it. I have heard from Mr. Pontius, traffic manager of the Los Angeles Pacific, that he has obtained, for the pleasure of the visitors, free transportation over the Scenic Railway at Venice, which has cost \$60,000 recently to complete, and if you want to get a joy ride, you may have it. Also the new Aquarium will be open for the members and their families. The management extended the courtesy of the Miniature Railway at Venice to you. The Los Angeles & Redondo Railway were much disappointed in not being able to provide a special train for us over their line, and I have no doubt, if anyone will simply notify me, that we could obtain what is called here "white tickets" to take a trip over that line in off hours. Last is a letter from my dear old friend, Mr. Rawlins of the Southern Pacific, enclosing a letter from the general manager, Mr. Calvin. (Reads:)

Mr. Rawlins states that in view of all the other arrangements he don't know what the Southern Pacific can do for us, but I have no doubt but what they will be able to favor us in some way, and you know that you have a very cordial invitation to call upon them for anything that is consistent—that is, anything that will not break the United States laws.

I have a communication here also from the manager of the balloon anchored down here on Broadway. It will take you up

1,000 to 1,500 feet, and that will give a most excellent view of Los Angeles and the country surrounding it. I say this the last, because he did not come through like the others have, but he did offer to make some concession—a half rate for members of the association, provided that there could be gotten together as many as fifty members, and to make the ascension between the hours of 8 A. M. and 11 A. M., really the best time of the day to make it, and if any one of you is in the humor of going up in a balloon and standing a good show for getting back—I know, for I have tried it—if you will make up a little party of fifty, he will make you a rate of 50 cents a ride.

The Secretary: I have the application here of W. S. Fender, assistant Superintendent of Telegraph of the Southern Pacific at San Francisco, for active membership, the same has been approved by the Executive Committee, and I move that we refer back to that order of business and elect this man.

The President: I should like very much to take action on this particular application immediately. We want Mr. Fender with us just as soon as possible. It not only means \$7.50 to the association, but it means an associate on the part of our Southern Pacific Railroad. If you have no objection we will proceed to take a ballot on it as with previous applications. Is there anyone else that wants to put in any application at this time for any active member?

Ballots passed, collected and canvassed.

The President: Gentlemen, you have voted unanimously for W. S. Fender, assistant Superintendent of Telegraph of the Southern Pacific as an active member of the association. You have one more application here.

The Secretary: Mr. President, I have also to offer for associate membership the name of E. K. Dyer, which has been approved by the Executive Committee.

The President: The Secretary will please prepare the usual ballots, and we will handle the matter in the usual manner.

Mr. Walstrum: Before more applications are in we might postpone the matter until the last day and vote for all at one time.

The President: This is the last one.

Ballots passed, collected and canvassed.

The President: Everything seems to be unanimous today. If we were to keep up that spirit we would get through in nice shape. E. K. Dyer is elected as an associate member.

Mr. Walstrum: I move we adjourn for today.

The President: Hold that motion just a second, the Treasurer has an announcement to make.

The Treasurer: I will be glad to see you gentlemen at the desk where I am ready to receive dues, and want to get them.

The President: Now, gentlemen, it seems to be the desire to adjourn about this time, and on account of a great many of the out of town members being tired, we will consider the motion made by some one back there to adjourn for the day. Until what time?

A Member: 9 o'clock.

The President: Until 9 o'clock tomorrow morning. You have heard the motion, all in favor of it will signify it by saying aye. Contrary, no. Adjourned.

SECOND SESSION.

The meeting was called to order at 9:35 A. M., by President Dyer, Tuesday, June 21.

The President: On the adjournment yesterday we were on work under the head of unfinished business.

The Secretary: Report of standing committees.

The President: Standing committees, yes.

The Secretary: And we were to have Mr. Griffith's report at 10 o'clock.

The President: Mr. Griffith is not here now. What else will we take up then?

A Voice: Mr. Griffith was outside a few minutes ago.

The President: I will say for the benefit of the visiting commercial telegraph people that Mr. Griffith is to have a paper this morning on the "Delivery of telegrams to trains." We thought it would be interesting to the representatives of the commercial companies to hear this paper and the discussion following, and that will be taken up at 10 o'clock, about twenty-five minutes. In the meantime we will try to dispose of some other business.

The Secretary: If Mr. Bennett is ready with his high tension report that he wants to make.

The President: I understand that is to be taken up at a special meeting on Thursday the 23rd at 7:30 P. M.

Mr. Bennett: Mr. President, there is one thing—I find the mail contains the formal report of the High Tension Committee. That formal report would be proper business to receive during the convention, and let the convention act upon it. The discussion could be held just the same Thursday evening, but I understand that would be a discussion between all the various interests—telegraph, railroad, electric light or power companies, etc.

The President: Would it not be well to have those people hear that report in order to—

Mr. Bennett: I don't really think that is essential. This is the official report of the committee to the association, and any discussion that we might have with these interested parties

Thursday evening would not necessarily involve the use of the committee's report to the association.

The President: Nothing except give them an idea of what the committee is doing. Then let it follow Mr. Griffith, I see he is here now.

Mr. Griffith, if you are ready, we will have your paper on the "Delivery of Telegrams to Trains."

Committee report on "Delivery of Commercial Messages to Passengers on Trains," to be read by E. P. Griffith.

Mr. President: Your committee, appointed by the chairman of the Eastern Division of the Association of Railway Telegraph Superintendents, to confer with the Telegraph Companies' officials for the purpose of establishing an adequate and uniform system for the delivery of Commercial Telegrams to passengers on trains, met in conference with Mr. A. G. Saylor, General Superintendent, Western Union Telegraph Company, and Mr. M. M. Davis, electrical engineer of the Postal Telegraph Company, in New York City, on May 24, last, and discussed the various phases of the subject. It was shown by the reports of the Commercial Telegraph Companies that the methods of making deliveries to passengers on trains, varied considerably, and a large percentage of the telegrams of that character failed of delivery, such failures causing the addressee, as well as the sender, to criticise both the railroads and the telegraph companies.

The railroads generally are alert to adopt any safeguards suggestive of the protection, comfort and contentment of their patrons. They endeavor to give the traveler ease of mind and all the comforts of home. The Commercial Telegraph Companies are equally anxious to perform a perfect service and thereby please their patrons.

Your committee, in their search for information on the subject, are indebted to Mr. G. A. Cellar, Superintendent of Telegraph, Pennsylvania lines west of Pittsburg and Mr. J. C. Johnson, Superintendent of Telegraph, Pennsylvania lines, east of Pittsburg, for copies of a general order issued by the Pennsylvania lines in 1905, entitled "Handling of Commercial Telegrams, Addressed to Passengers on Trains," which instructs their agents, conductors and employes generally to co-operate with the commercial companies in their efforts to make deliveries. The action taken by the Pennsylvania lines in 1905, has, no doubt, enabled the telegraph companies to effect a larger percentage of deliveries on that line than on any other road, and if all the railroads will do no more than adopt the Pennsylvania Lines' General Order of 1905, great progress will be made in the right direction.

It has been suggested to your committee, however, that this association may be able to go further in the matter, by recommending to the General Managers' Association and the General Passenger Agents' Association, that a general order be issued by the railroad companies, instructing their agents and other station employees, to aid the Telegraph Company's messenger to reach direct the conductor of the train and instruct the conductors to receipt, on the telegraph company's regular delivery receipt forms, for the messages addressed to his train, or in his care, and in case the conductor is unable to find the addressee on his train, he shall note on the telegraph company's envelope "Unable to find addressee on train No. — between Poland and Podunk, James Smith, Conductor, 11:10 A. M., June 22." He shall then place the telegram in a railroad envelope, address it to the agent of the station where the messages were delivered to him, and send it back by train mail. The station agent receiving such undelivered telegram shall immediately notify the Telegraph Company, over whose lines the message was handled, as indicated by the envelope, to call at his office for undelivered

telegram, addressed to James Smith, care of conductor train 10. Should there be a second section of any train, the conductor of the first section, failing to find the addressee, shall endorse on the envelope "Cannot find on first section train 10, try second section" and put the message off at his next scheduled stop. The agents at all stations shall comply with the endorsements on such telegrams, the same method to apply should there be a third or fourth section, the conductor of the last section, failing to locate the addressee, shall return the message in a railroad envelope, addressed to the agent at the station where the message was handed to the conductor of the first section. The telegraph company shall issue a general order to all managers to procure full address from the sender: for example—"To John Jones, en-route Washington to St. Louis, B. & O. R. R. Train No. 10, care Conductor Parkersburg, W. Va." The telegraph company's receiving office shall place full address on the envelope as a guide to the railroad conductors in returning undelivered messages to the proper station.

It has been suggested by the commercial companies that all telegrams, for passengers on trains, should be addressed in care of the railroad company's station agent, who should receipt for and deliver the same to the conductor of the train mentioned in the address. Your committee is of the opinion that such an arrangement might lead the agent to believe that the addressee would call at his office for the telegram, and a complete failure result. It is, therefore, the conclusion of your committee, so far as the address on such messages is concerned, that they should be addressed in care of the conductor of the train, and the telegraph companies should make the delivery to the conductor. The old method of having the telegraph company's messenger page the trains, while stopping at a station, is, in the opinion of your committee, unreliable. At stations, where a stop of five minutes or more is scheduled, the passengers, as a rule, take ad-

vantage of the stop to exercise themselves on the platform, while the messenger is passing through the train.

The Pennsylvania lines general order, already referred to, says, "The messenger should also, for the purpose of delivering such telegrams, be permitted to pass through the train, if the stop thereof be of sufficient duration to enable him to do so and leave the train with safety."

A direct delivery to the conductor of the train eliminates the danger to the messenger, releases the railroad company from liability of injury to such messenger, and finds all the passengers in their proper seats, when the conductor passes through the train after leaving the station. Your committee recommends that the Association of Railway Telegraph Superintendents, now in annual convention, appoint a committee to communicate with the General Passenger Agents' Association, forwarding to them a copy of this report, and requesting their endorsement of our efforts in this direction, and if their endorsement shall be favorable, the same committee shall take the matter up with the General Managers' Association, with a view to the promulgation of a general order through the railroad operating departments, on the lines indicated in this report, and if the General Managers' Association shall acquiesce in the matter, the committee shall then notify the commercial telegraph companies and request them to instruct their managers accordingly.

E. P. GRIFFITH,

Superintendent of Telegraph, Erie R. R. Co.

J. C. JOHNSON,

Superintendent of Telegraph, Penna. R. R. Co.

C. M. LEWIS,

Superintendent of Telegraph, P. & R. R. Co.

Committee.

Mr. Griffith: In connection with the report, Mr. President, I received a communication from the Western Union Company, which I shall make a part of the report. It is a letter from Mr. A. G. Saylor, General Superintendent Western Union Company, New York, dated June 13, addressed to me. I had given him a copy of this report for his information and guidance, he being present at the conference held in New York.

New York, June 13, 1910.

Mr. E. P. Griffith, Hotel Alexander, Los Angeles, Calif.

Dear Sir: Referring to copy of report of the Committee of the Association of Railway Telegraph Superintendents, to the President, in connection with the delivery of telegrams to passengers on trains,—I am advised that the report as drafted covers the matter admirably and is entirely satisfactory to the Western Union Telegraph Company, except that it is pointed out that the proposed regulations make no provision for marking on the message envelopes, the names of stations at which messages are received and delivered, to check the recollection of the conductor in returning the same, if undelivered or to guide the conductors of following sections to whom the message may be handed for disposition if delivery is not effected by the conductor of the first section. This is a matter which we can cover in our own instructions on the subject in case the proposed regulation is adopted at the meeting and followed by the railroad companies; however, it is suggested that it might be well to include this additional detail in the committee's report, if acceptable to them.

Yours truly,

A. G. SAYLOR,
General Superintendent.

Mr. Griffith: Mr. President, if Mr. Lewis of the Postal, and Mr. Lamb of the Western Union—and I believe Mr. Davis of the Postal is in the room—I should like to hear any criticism they may have, or suggestions to make in connection with the report.

The President: Mr. Lamb, may we hear from you?

Mr. Lamb: I think that seems to cover the ground. We have something similar out here already in use, although not quite as complete as outlined in the report mentioned—or read. The difficulty seems to be on going through the train to locate the passenger, the person having the message to deliver does not call the name correctly—or clearly enough to have it understood. I don't know whether that can be remedied or not, possibly it might. My own idea has been that the brakeman as a rule takes telegrams, he goes through waving the message or telegram, saying “yem, yem”,—nobody knows what that means, unless somebody is looking for a telegram—I generally am and when I hear that noise I say “Yes, that's for me,” but the ordinary passenger wouldn't be able to understand it. And perhaps if you could just embody some instructions to the brakeman, or whoever carries the telegram through the train, to speak the name of the passenger very distinctly, it might insure delivery, when otherwise you would not be able to deliver it. That, I think, is the only amendment I could suggest on the recommendation made by the committee.

The President: Can we hear from Mr. Davis?

Mr. Davis (of the Postal): I have very little to say on the subject. I was present at the meeting in New York, and I think that this is an important thing to do. Passengers are so frequently embarrassed by failure of delivery that I think both the telegraph companies and the railroad companies should do all that they can reasonably do to insure delivery. Now, I can

think of no way that is more likely to insure delivery than to charge the conductor with that work. To be sure the conductor will elect somebody else as a rule, and that someone else may be very careless about our business. Going through the trains don't accomplish delivery: I don't think they accomplish delivery in certainly not more than 50 per cent of the cases—50 per cent is doing well. And all I have to say is that I think this association is acting wisely in endeavoring to have this report adopted by the railroads generally, and then as to arranging for the returning of undelivered messages, or of insuring that employees of the railway companies speak distinctly—we will have to fight that out—but the move itself is one that I am glad this association has taken up, and if I can do anything in our company to co-operate I am sure I shall be glad to do it, and I know that my company will sustain me.

Mr. Camp: Mr. President, I am also afflicted, like Brother Davis, with a bad voice.

A Voice: Mr. President, will you please introduce the speaker, he seems to be a stranger.

The President: Mr. W. J. Camp.

The Secretary: He is not a stranger, he simply has lost his mustache.

Mr. Camp: I coughed so much last night I coughed the whole mustache off.

Some three or four years ago the Canadian Pacific Railway Company's telegraph department realizing the number of telegrams that were not delivered on account of the irregular manner in which they were forwarded to the passengers on the train, devised a form,—of which I have brought several samples here, if you will just pass them around—to try to get over the difficulty. The messenger is supposed to go down to the station

and deliver the message with this form to the conductor. You will notice it is in duplicate—or rather it is in two sections. The conductor or porter, as the case may be, signs the first part of the form, and if he is able to effect delivery to the passenger, takes a receipt from the passenger on the second portion. This second portion is then attached to his trip report and forwarded to headquarters. If the conductor is not able to effect delivery he leaves the telegram at the next telegraph station, advising the operator of non-delivery, and taking the operator's receipt on this form. It is the duty then of the operator at that telegraph station to advise the originating point of non-delivery. The form as it is is rather crude. I got it out myself without any consultation with any other company, but it answers the purpose very well for the time being. I didn't know about the subject coming up at the meeting of the Eastern Division, unfortunately I was not able to be present, or else I would have mentioned it. Mr. Griffith's report had already been made up when he learned we had such form in use.

As far as our company is concerned we would be glad to alter the form so as to get something uniform throughout the whole country and cover defective parts of the present form that we have in use. At the same time we were getting out this other form I got out one for telegrams filed by passengers which has covered another portion of the telegraph service that has been found defective. Frequently on trains a passenger will file a telegram, or claim to have filed a telegram, and that it never reached its destination. The form I got out for distribution on our parlor and sleeping cars is that which I have just distributed. You will find attached to it two coupons: one is torn off and given to the passenger as a receipt for telegram to Los Angeles, 75 cents collected on June 20, for instance, signed by the conductor or porter. That forms a receipt to the passenger that he has actually delivered the telegram to an employe of the company. The porter or conductor thus obtains

a receipt from the first telegraph station on the other copy, but instead of retaining it himself he turns it in to the head office with his report, because should the porter or conductor leave the service, then the company would still have the record and be able to ascertain correctly whether the telegram had been properly handled or not.

I don't think the form is really a good one, and can be much improved, and if the committee that is to be appointed will evolve with this foundation something much better the Canadian Pacific Company will certainly only be too glad to pledge its support.

We hold the conductor responsible for all telegrams delivered to him. No instructions are contained on the form, but we find it is the only safe way to do. The only satisfactory way to do. That is about all I can say on this subject, Mr. President.

The President: Mr. Lewis, is he in the house? Mr. Stevenson, can you give us a little information.

Mr. Stevenson: I am not prepared, Mr. Chairman, to make a talk on the matter. I expected Mr. Lewis—he is not here, however, but I expect him in a few moments.

Mr. Sheldon: Mr. President, I would like to mention that the Union Pacific Railway has adopted for many years and in use on their lines the system which is now recommended in the committee's report, all the way through. The conductors' train book which they use has messenger's receipts printed in their book, and they accept from the operators and receipt to the operators on the regular form for the message, they deliver it in the train, take the receipt from the passenger in their book, and if they cannot find the party who the message is to be delivered to they turn it in at the next station with their notation on, just exactly as has been recommended by the committee. We have very little trouble.

The President: Does the conductor personally attend to that?

Mr. Sheldon: Yes sir, he gives the receipt for it, he is responsible—he generally has somebody go through the train and personally look after it.

Mr. Camp: Mr. President, there is one thing I forgot to call attention to; this form varies from the recommendation of the committee in that at the office of the station where the conductor returns the message to the commercial department of the telegraph company, it is not sent back to the station where it was placed on the train. The operator at that station where it was returned to the company advises the originating operator direct, thereby saving delay in getting it back by mail to the previous station.

Mr. Sheldon: That is our system.

Mr. Griffith: Mr. President, your committee considered the question of having the railroad operator report the non-delivery of the message, but it must be taken into consideration that we have three telegraph companies—the Western Union, the Postal, the Philadelphia & Reading, in the United States, and the Canadian Pacific in Canada and the northwest. It may be that a postal telegram was delivered to the conductor of the train on a railroad where there are no postal lines except in the large cities. Then it would hardly be expected that a Western Union operator in a little station of the railroad company would send a non-delivery notice to a postal office, or vice versa. Therefore, the thought occurred to us in order to provide for all telegraph companies to have it go back by train mail, make it a railroad mail matter to the station where it originated, giving notice to whatever telegraph company may have handled the telegram.

Mr. Bennett: Mr. President, I have had some complaints concerning telegrams addressed to passengers on trains not a few of them of a financial character. They have complained that a telegram was not sent and the money was not returned. I haven't noticed anything in the document that is presented here in behalf of the Canadian Pacific, or in the report of our committee which seems to me properly to cover that phase of the matter. Mr. Camp's blank is a telegram blank for a message to be forwarded just the same as the Postal or Western Union has on parlor cars and sleeping cars. It has attached to it two coupons, one of which is a receipt from the conductor or porter given to the passenger and states the amount collected. But the passenger may give the porter or the conductor 25 cents or 50 cents to pay for a message the correct tolls upon which are not known to the conductor or the passenger; then there is some change to be returned to the passenger. The operator's receipt at the point where the conductor or the porter files the message for transmission states the amount collected, and from those two you can determine how much change should be returned to your passenger, but, unfortunately, the operator's receipt is to be attached to the conductor or porter's trip report to be sent to the superintendent of sleeping, dining and parlor cars, and so I don't see how the passenger has a check on the handling of his money and his telegram. He can, if he thinks he was swindled, surrender his receipt from the conductor or porter and have the matter traced out, which is better than anything I know of at present in existence. I suppose by sending that receipt to the superintendent of dining and parlor cars the matter could be checked.

Now, as to messages addressed to parties traveling on trains, the question arose in my mind concerning the matter of returning an undelivered telegram to the sending station in a railroad envelope. I would look upon that telegram as a private communication from John Doe to Richard Roe on their private busi-

ness. It is being conveyed by a telegraph company, not by the railroad company, and I question whether possibly that would not be committing an infraction of the postal laws of the United States if we carry that communication back by railroad mail. Perhaps I am wrong about that, but it is something to think about.

Again, as to submitting a copy of the committee's report to general passenger and ticket agents for criticism and suggestion, I would make this suggestion, that the committee which has been asked for having formulated its rules in concise form for transacting business of this kind, such rules before being recommended to the telegraph companies be submitted to these railway officers for criticism and suggestion. I think they are familiar with a large part of the matters that are mentioned in the full committee report, and it might be quite burdensome to send full copies of that to everybody in the passenger service. Probably the rules thus formulated would answer the purpose better and not leave the burden upon us.

Mr. Camp: Mr. President, referring to a remark of Mr. Bennett, I might say that so far as the Canadian Pacific Railway is concerned, all the sleeping car and parlor car porters are supplied with telegraph tariff books so that if a passenger questions the amount being collected by the porter he is able to verify it, if he can manage to wade through the intricacies of a telegraph tariff book.

Mr. Griffith: Mr. President, in line with the remarks regarding protection to the passenger as to the amount paid, the committee who we may appoint to take this matter in hand might consider when in session with the General Managers' Association, a rule being promulgated by the railway companies requiring the railroad employee who accepts the messages and the tolls to show to the passenger, after he has procured receipt from the telegraph operator, the amount he has paid for that tele-

gram, and show it to the passenger and making the proper change, then file the receipt with his trip report.

The Secretary: Mr. President, this seems to be a very important question, and I think it would be a hard one to work out. And I will move you that a committee be appointed of three, with Mr. Griffith as chairman. That they gather data and special rules and report at the next meeting some form to be adopted.

Mr. Camp: Mr. President, I have very much pleasure in seconding that motion. I don't think we could have it in abler hands than Mr. Griffith and the present committee.

The President: Gentlemen, you have heard the motion. With Mr. Griffith's permission I would like to add two names to that committee, making it a committee of five, unless you think that is unnecessary.

Mr. Griffith: I was going to make that suggestion, Mr. President. And furthermore, I should like to amend the motion; as the motion stands I believe it says they shall report at the next annual meeting—that is a year hence. We should promulgate this thing inside of sixty days. Why not give that committee power to confer with the General Managers' Association and promulgate the order within ninety days.

The Secretary: I consent to the amendment, as long as the committee would do that work it will be agreeable.

Mr. Camp: Make it the main motion.

Mr. Davis: Before you put the motion, Mr. President, may I say a word regarding this committee making this report—that I think the work of this committee has been remarkably well done.

The President: I was just going to remark that I consider this a most important matter, and must congratulate the committee on the excellent work performed so far, and I think that if you will revamp with the blanks submitted and those that

have been placed by Mr. Camp, the matter can be worked out to prove satisfactory to all lines. It is a custom on our line where train auditors are used that they perform the service of delivery. On some railroads the intention is to release the train conductor of all clerical work, or work with passengers or otherwise. The train auditor having a complete check on the train is better prepared to locate a passenger than a train conductor who does not handle the tickets or have anything to do with the passengers, only taking care of train orders and the handling of the train. However, the committee will no doubt consider all of that.

Before placing the motion, I would like to ask Mr. Chace of the Santa Fe how they handle it on the Santa Fe.

Mr. Chace: Mr. President, the operator delivers it to the conductor who takes his receipt, and in case of non-delivery it is turned in at the next office and reported to the telegraph company.

Mr. Rawlins: We have substantially the same. Message is delivered to the conductor and it is optional with the conductor as to who shall make the delivery; if he is tied up with train orders and can delegate the duty either to the porter, auditor or the brakeman, he does so. I think in most cases the actual delivery is made by the brakeman, and if the brakeman happens to have a better voice than the conductor, he can accomplish the delivery more readily. But we have very little trouble on non-deliveries. But I think that the feature of taking the passenger's receipt, which seems to have been left out in the report of the committee, is very important, and that receipt should be taken. Lately we have had a case where it cut quite an important figure. It seems the message was delivered to the wrong party, happened to be a confusion of names. If we had a receipt even from the fellow who got the message, which we haven't, we would be in better shape. It seems to me the receipt from the passenger should be taken in all cases whether delivered by the brakeman.

train auditor, conductor, or whoever it is. We, however, did not give the passenger a receipt for his money, which seems to me should be done. Then we have—for the information of the committee—we have a case now where a message was filed by a passenger asking for an answer on the train. He paid for the message, and, presumably, was prepared to pay for an answer if anybody asked for it, but it wasn't, and the reply to the message was refused because the operator didn't know where to locate the passenger that he might be on that train and might not, and he refused the message, and in this refusal I believe he was sustained by the telegraph department. I made the point that if the answer to the message calling for an answer ought not to be taken the original message calling for the answer ought not to be taken. I don't know what action the telegraph company is going to take on that, I haven't heard from that. That is a case that has come up in actual practice and the original sender is probably going to ask for damages because he didn't get any answer.

The President: This is a most important subject, I consider, not only a protection for the commercial company which is operating over the railway but it is of great value to the railroad company itself to protect its passengers in handling their telegraphic communications and protecting them in the way of paying proper rates for telegraphing. I have found several cases where a passenger has been overcharged, and there has been a number of cases where telegrams have been delivered to the wrong parties, or stuck in the pocket of the conductor and carried two or three days, and thereby not delivered. I should be glad to hear from others on this subject. Has any one else anything to say concerning this?

Mr. Bennett: Mr. President, while this discussion is not exactly parliamentary as there is a motion before the house, it is exceedingly interesting, and I think we all want to hear it.

A telegraph company is very particular—that is to say, the Western Union Telegraph Company, which is the only public service company that our railway has to deal with—about its receipts for messages delivered, called Form 87. The discussion has developed into something rather along the line of advice to our committee, and with due apologies I desire to give a little. Now, no doubt the telegraph companies would like to be consulted concerning the forms to be used for receipt for the passenger's money and receipt for delivery of the message, and form of notice that it is not possible to deliver the message, and all of those things, and to secure some method of obtaining these documents, to protect themselves in case of claim. Those are all matters which of course should receive careful attention on the part of the committee.

Another thing, we also have train auditors, but not on all trains. We have train auditors on the heavy through fast trains, and on local trains which are heavily loaded, to relieve the ordinary train conductor from the necessity of taking care of passengers, looking after time orders, protection of his train from hot boxes, and all that sort of thing, but it has been suggested here that the train auditor might be employed to deliver these messages. I think as a matter of actual practice—my experience has been more along the transportation of railway service than along strictly telegraph lines—that the ordinary conductor usually has one brakeman on his train who has been a member of his crew for quite a long time who is his trusty man. He generally turns the telegram over to that man and sends him through the train with it to find the party addressed, and sometimes he goes himself—it depends a good deal on the character of his run and the amount of work to be done at the time the message is put in his hands. We might arrange our rules with respect to responsibility of the persons who are to handle the messages somewhat after the manner of the American

Railway Association formulated the rules, which may be modified to suit the conditions on different railroads.

Mr. Camp: May I be permitted to make one or two more remarks?

The President: We are glad to hear from you, Mr. Camp.

Mr. Camp: I think that it is certain that every railway company is only too anxious to facilitate the delivery of telegrams to their passengers, whether that railway, as in the case of the Canadian Pacific, is engaged in the telegraph service itself or not. And it doesn't matter whether the telegram is one of the railway company's own telegraph department or coming from any other telegraph company. A passenger finding any defective service in his telegraph business while he is traveling on a railroad doesn't as a rule blame the telegraph company, but blames the railway company over which he is traveling. The forms, which I might add were primarily designed for carrying our own commercial telegraph business, but I think if a general form is devised by the committee that all railways, whether engaged in the telegraph service or not, will endeavor to apply the forms and conditions thereto to telegrams whether it is filed by themselves or any other telegraph company. I think that is the general sentiment of the Railway Telegraph Superintendents here. I know for my part, speaking for the Canadian Pacific Railway Company, we are only too glad to assist our passengers in getting their telegrams by the Great Northwestern, Western Union, Postal or C. P. R.

Mr. President: Mr. Roome, you are an old telegraph superintendent, can't you give us a word or two on the subject?

Mr. Roome: Why, I feel that there is not anything that I can say at this time that would be of much benefit, in view of the fact, that it has been thoroughly threshed out in your committee. But it does seem to me that the rule as in effect on the

Canadian Pacific, having the passenger receipt for the telegram, would be as much as most people would want. I think Mr. Camp's scheme of having the operator at the station where it is put off open the message and send it back to the next office a good one. I think we had something like that in effect on the Southern Pacific lines in '93. Of course as a rule in the case of a lot of train men, it is liable to be set aside and forgotten, and the prime object I should think in a matter of this kind would be to require some discretion. Of course we know they are prone to forget things and set them aside.

Now, in regard to delegating to a brakeman the delivery of a telegram, my observation has been in traveling on passenger trains, that in so far as the passenger conductor's duties are concerned, I have never noticed that they were so numerous and onerous in their handling a telegram, which is of course of paramount importance especially when it is delivered to a passenger on the train. Of course the average conductor wants to shirk about all the work he possibly can, that has been my experience with them. I think that the method that has been set forth by Mr. Griffith's committee and the remarks made by Mr. Camp, if they are all embodied into one circular or report and submitted to the General Managers' Association, I feel certain that they would be glad to adopt them.

Mr. Bennett: Mr. President and members, if I may be pardoned for speaking again—there is one other matter I wanted to mention in connection with Mr. Griffith's talk and that is in regard to the service message to the sending office notifying that the telegram had not been delivered. I would think that in a small territory, or in a larger one where the companies are operating in competition with each other like that described by Mr. Griffith, the telegraph companies themselves should all make a joint arrangement about service for their mutual benefit. I have not read the newspapers for about a week, for I haven't had time, but I assume we are about to have our telegraph and

telephone companies placed under the jurisdiction of the Interstate Commerce Commission, and one of the things which is sought to be accomplished is to prevent discrimination in rates and service. It might be said that perhaps a telegraph company would not be permitted to free service message another company on matters of that kind, but I think that our commission would be likely to take the view that these are all public service corporations, and that the public should have the benefit of a mutual arrangement of that kind, and that inasmuch as the service would be performed for any individual under like circumstances and conditions that probably there would be no objection to such arrangement.

Mr. Ghegan: Might I say a few words? This discussion has been exceedingly interesting to me and brings me back to my early days in telegraphing. It reminds me of one point which has not been covered in the discussion here, and that is where a passenger does not hand the conductor or operator sufficient tolls to pay the message and he is lost track of, what is to be done then? I remember very well that I was operator at a station on Market street in New York, and a gentleman rushed in from the train with a message for Fall River and put down 25 cents or 30 cents, whatever the amount was, and rushed out to catch his train, and when I came to figure up the tolls he was about 6 cents short. Well, 6 cents to an operator getting \$40.00 a month those days was a whole lot, and the question then was what to do with the message; whether to pay 6 cents, send collect, or what? I was new at that time in the business, and I concluded to send the message collect, and I waited the 48 hours, and I didn't get any notice that the receiver had refused to pay for it, so I mailed him the amount he had left me, less the postage. I got a letter from him a few days afterward, and I have that letter yet. In the letter he enclosed two 25 cent "shin plasters" for a smoke, and apologies for not paying the toll on the message. Now, it may even happen that a

message is handed in without sufficient to pay the toll, may be a few cents short. I think it would be well to discuss such as that.

Mr. Bennett: I would suggest that the motion be put in proper form and read.

Mr. Griffith: I should like to amend it. I amend the motion to read that the secretary of this association shall cause the minutes of this particular discussion and paper to either be printed or typewritten and sent to every member of the committee which you shall appoint within 30 days.

The President: Gentlemen, we will vote on the amendment, if you will second it.

Mr. Van Etten: I will second the amendment.

Which amendment being put to a vote was carried.

The President: The main motion is that the present committee be continued with the addition of two names. On that committee I will appoint Mr. Griffith, Mr. Johnson, Mr. Lewis, Mr. Camp and Mr. Bennett, which makes the committee of five.

Gentlemen, at this time I want to mention the fact that in the large banquet room there is on exhibition a number of devices that will no doubt be very interesting for the members. Unless there is some serious objection, I would like to have us take a recess for one hour to look over these exhibits, and then return to the convention room where we may proceed with the regular order of business.

Oh, I overlooked placing the main motion by Mr. Van Etten for vote. We will now take up the original motion.

The motion as amended being put to a vote was carried.

The President: Now, the committee will stand as outlined.

Mr. Bennett: I move, Mr. President, that we adjourn from 10:35 to 11:35 to visit the exhibits.

Which motion on being put to a vote, after being seconded, was carried.

At 11:35 A. M., the convention was called to order by the President, Mr. Dyer.

The President: If you will come to order we will have Mr. Launbranch's paper on "Lightning Protection."

Paper "Protecting Telephone Lines from Lightning and other Disturbances" read by Mr. Launbranch.

PROTECTING TELEPHONE LINES FROM LIGHTNING AND OTHER DISTURBANCES.

The protection of telephone lines from lightning and other disturbances is assuming more and more importance with the increasing use of high voltage power transmission; and as the telephone is extending into new fields.

Although the telephone is in a high state of development at the present day, there is still a great deal to be desired; and each time a new field is entered, new conditions arise, so that the telephone engineers are kept constantly busy meeting such conditions and developing new schemes for improvement of service. The rapid development of other branches of electrical transmission such as power transmission lines, light circuits and trolley roads, in all parts of the country, has multiplied the troubles of the telephone circuit; which not many years back held undisputed sway throughout the rural districts, and literally possessed the earth and compelled it to do part of its work, as ground circuits were most common then. These ground circuits are rapidly being driven out of existence by these other circuits of high potential taking possession of the territory.

In addition to this we have the ever present atmospheric conditions to contend with, such as lightning and other static disturbances. As all high tension lines are circuits for the transmission of electric currents with inanimate machines to transmit and receive the power, the telephone line is a circuit for the transmission of human intelligence and a human being is the generating and receiving machine.

In the first group of circuits we must protect property from injury or destruction caused by the atmospheric disturbances or disturbances created within themselves. But on a telephone line we must provide protection not only against disturbances, injury or destruction of property, but against injury and annoyance to user.

As stated in our subject, we shall confine ourselves to the protection of telephone lines, and more especially to lines in railway service. Let us first take disturbances from lightning. These are of two kinds, direct, and indirect or induced. Fortunately the most destructive is the least experienced; namely, the direct flash. And this is certainly very fortunate when we realize that no very effective protection has ever been designed to guard against its destructive effects, such as destroying entire cable terminals, melting heavy copper leads and instruments. By far the greatest amount of lightning disturbance is caused by induced charges and these range from those that burn out the coils, transmitters and receivers, to the annoyance experienced by a dispatcher getting a crack in the ear from the static charge passing from one wire to the other through his receiver, or the surging and snapping one hears on long lines during electric storms and even dry snow storms.

PROTECTION FROM DIRECT FLASH.

As stated, no real successful protection against direct lightning flashes has been designed for telephone lines, or at least none which would be considered commercially economical con-

sidering the small percent of loss due to such causes. A protector for such a purpose must have large carrying capacity and low resistance to lightning discharges. Such protectors have been designed for use on power transmission lines and are of two types, electrolytic, and multiple air gap combined with resistance. Such arrestors are not only for the protection of lines from lightning but from excessively high potentials created within themselves.

It is a question whether protection can be provided to guard against such disturbances, when we consider the enormous energy in a discharge which has pierced through, often times over half mile air gap, so that the remaining distance after it hits the line amounts to very little. It will often not even go down the ground lead, but will melt the wire it first hits and then shoot off through the air and hit some adjacent object, no matter how good a ground you may have, although a ground should always be of the best. Of course these direct flashes vary in intensity and every possible means should be provided to take care of them; and there is no doubt that a dispatcher's line or message wire is far better protected against such disturbances than the ordinary single station telephone line, due to their being equipped with arrestors at every station, which act like a long drawn-out picket fence of grounds which do a great deal towards dissipating the charge by assisting in preventing it concentrating toward one point.

As stated before, destruction from a direct flash is very rare and even when a line is struck the energy of the flash is so great that it does not always follow the turns and twists of a wire entering a building. This is the reason one so seldom hears of a person being injured by lightning while using a telephone, which speaks well for the present day protection; and this is especially true of the dispatcher's line, as the writer has heard of only one burn-out in two years on any such circuits, and no one was injured in the slightest degree at that time.

PROTECTION FROM INDUCED CHARGE.

It is oftentimes hard to distinguish between a direct flash and an induced discharge from the damage done, as an induced discharge is sometimes so intense that it causes as much destruction as a direct flash—at least its practical results are just as serious as far as putting the line out of service, and also, as to its being dangerous. As stated before, that although this trouble, due to induced discharge, constitutes by far the greatest per cent of all the disturbances experienced on telephone lines, only a small portion of this is dangerous to persons; the greater portion being such as to cause annoyance to the service. The majority of these troubles may be enumerated as follows: Burned out coils in relays, bells, and receivers; punctured condensers; conductors in cables destroyed; insulation in cables reduced by charring of insulating material; blowing holes through sheaths of cables; thus letting in water and putting cables out of business.

The so-called burning out of coils often consists of discharge taking place between different layers of the winding, and either short circuiting the coil or fusing off the wire, as it is often very fine; and thus opening up the coil. Very often, however, the energy of the discharge is so great that the coil is entirely destroyed in dissipating the heat. In puncturing condensers it often occurs that after the discharge takes place, enough current follows to burn out the cross between the plates, leaving it as good as ever, so that the trouble-man is mystified when he sees evidence of lightning having passed through the condenser and still find it O. K.

I have gone somewhat into detail in the foregoing, so that we may have clearly before us just what we must protect against.

PROTECTION OF APPARATUS.

To protect our apparatus it is very evident that we must provide a path for the static charge, of a lower resistance than that

found between winding of fine wire, with thin insulation on coils and between plates of condensers, as these are the weakest spots that must be protected. The first attempts at lightning protection to telephones was the toothed plates mounted closely to the ground plate, similar to that used in telegraph service. This served the purpose to some extent, but was not as efficient as protectors of later design. The protector now most used consists of carbon blocks separated by very thin sheets of mica. Although these protectors are of various designs the principle is the same; namely, the flashing of the discharge between the carbon blocks across the intervening air-gap. Some such arrestors are provided with a piece of fusible metal set into the center of one of the carbon blocks so that in case a discharge is followed by a volume of current the carbon becomes heated enough to melt the metal, which in turn forms a solid conducting path to ground thus putting a dead ground on the line and blowing the fuse. This type of arrestor has proven very efficient on the lines of telephone companies, and is used almost exclusively in exchange service.

As the telephone commenced to be used more extensively in railway service, new conditions arose which gave trouble and had to be met. One trouble with the regular carbon mica arrestor is that it does not always clear itself after each discharge. The consequence is that after a discharge there is generally left a dead ground on the line, or one of high resistance which is often enough to cause a noise. This is not of so much consequence on the ordinary exchange line where there are only a few arrestors, which are so located that the carbons are easily removed and cleaned.

On railway telephone lines another condition is met with; namely, that instead of from two to a possible ten telephones being on the line, there are from twenty to even a possibly sixty, with an arrestor at each station. Under such circumstances it becomes necessary to have an arrestor which will remain clear after each discharge, as here it is not only a question of protec-

tion, but that the service shall continue uninterrupted, as the business on these lines is of such vital importance compared with what might be going over a farmer's line which can stand having poor service for a possible half day, due to some protector being grounded.

About seven years ago, in making a study of telephone requirements on trolley roads, this question of high resistance grounds was one of the first difficulties we had to deal with. It was found that the regular carbon-mica arrestor, although it might not always become heavily grounded, would still give a high resistance ground due to the fine carbon lodging on the edge of the mica. These high resistance grounds would not be noticeable where there were only two or three instruments on the line; but when a greater number were connected these grounds having multiplied, they produced heavy noises on the line, this also being intensified due to the fact that these lines run parallel with high tension circuits, often on the same pole. To do away with this trouble a great deal of experimenting was done to find a substitute for the carbon block, by trying different kinds of metal such as aluminum, zinc, brass and copper. Sand blasting the surface to produce points was tried. The outcome of these experiments was the present copper block and mica arrestor, which is at present quite extensively used. This arrestor although it has cleared away a great deal of the trouble due to carbon dust, still has a path on the ragged edge of the mica for the accumulation of dirt; and possible carbon dust from smoke. It also does not fully take care of the discharge from one wire of circuit to the other, which more frequently finds an escape through the dispatcher's receiver than across the air-gap of the arrestor. To do away with the trouble caused by the accumulation of dust on the edge of the mica, and also, to take care of heavy flashes, a number of arrestors have been designed in the last few years. As an example of this type might be mentioned the O'Connell which is quite extensively used on train dispatch-

ing lines. This consists of large carbon blocks widely separated by insulation and set in V position in relation to each other, so that at the point of the V the edges nearly meet, this being the point of discharge. This arrestor has proved quite efficient as it not only clears itself quite readily on small discharge, but it has a capacity to carry heavy discharges and of caring for heavy flashes by blowing them out by means of its V-shaped air-gap. There are other types of arrestors which are designed to carry heavy discharges of different designs.

Two later arrestors put on the market is one using a partial vacuum for an air-gap between two carbon plates known as the VAC-M; the other is a departure from the air-gap principle entirely, and might be termed a direct contact arrestor and consists of carbon blocks being separated by means of a composition block instead of an intervening air-gap, and it is known as the Brach Arrestor. As these two arrestors are of quite recent origin we are not able to give any extensive data as to their efficiency under all conditions on the telephone lines. It might be stated, however, that these two seem to be lightning arrestors pure and simple and will not protect against power circuits of low potentials. However, they have the advantage of taking care of lightning discharges repeatedly, without leaving any ground on the line.

In the VAC-M the discharge takes place in the form of a brush discharge between two carbon plates across a partial vacuum. In the Brach arrestor the discharge takes place between two carbon blocks through the intervening static conducting composition block. It would seem that an arrestor of this type gives promise of quite an improvement for taking care of the greater percent of troubles and annoyances on railway telephone lines. The composition acts as a nearly perfect conductor for highly oscillatory current such as lightning and static charges, while it is of high ohmic resistance for direct currents.

This composition arrestor has been in service on block systems for two years and has given very satisfactory service. A number have recently been put in service on telephone lines and we see no reason why they should not clear away considerable of the trouble not being cared for by the present air-gap arrestors; namely, the annoyance of minute static discharges on railway telephone lines, and toll lines, and at the same time keeping the line clear of grounds.

At this point, I again wish to call your attention to the fact that a train dispatcher's and message service lines on railroads are far better protected than the regular long lines of telephone companies, on account of their having a number of arrestors distributed all along the line; and I believe I am making a conservative statement when I say that injuries to apparatus on these lines have been very rare.

If an arrestor can be produced which will care for static discharge without permanently grounding, and of high enough ohmic resistance to prevent leakage, there is no reason why this system of protection, namely, distributing arrestors along the line, should not be adopted on regular long distance lines.

PROTECTION FROM HIGH TENSION CIRCUIT.

Railway telephone lines being run on the railroad's private right of way are probably more free from the dangers to high tension crossings than the lines of telephone companies; still, with the ever-increasing growth of these high tension circuits the protection against these circuits is becoming more and more necessary in the more populous districts. The chief step to be taken in connection with protecting these lines is, of course, the high tension crossing which has already been thoroughly covered by the association specifications for these crossings. This, however, does not remove the necessity for providing protection on the lines themselves, where crossings from such circuits are made possible

by their presence. The methods in use for such protection are the lightning arrestor and fuses.

The same lightning arrestor discussed under protection from lightning, serves this purpose quite well; namely, the carbon arrestor, with small enough air-gaps to permit the flashing across of potentials, say 350 volts and over, and to fully protect the apparatus. In such cases a fuse should be provided which will open up when the current flows which is followed by the discharge.

As the standard commercial fuse will no always take care of the opening up of a circuit where crossed with a very high tension wire, other methods have been employed to protect the line; namely, where the danger of such possible crosses occurs, a section of the line is so constructed that in case it is crossed by the high tension wire, a section of the line will disconnect itself and drop out, thus making a break long enough to break the arc.

SUMMARY.

Taking the whole subject of arrestors we have the following conditions: The carbon air-gap arrestor is necessary to protect lines from crossing with other circuits of 350 volts and over, and the heavier lightning discharges followed by current. An arrestor of efficient static carrying capacity is desirable to take care of the larger percent of troubles and annoyances due to static discharges. It would therefore seem that an arrestor which would take care practically, of all the troubles on railroad telephone lines should consist of large carbon blocks with a small air-gap at one point, the blocks to be insulated from each other by means of a highly efficient static carrying material; such material to be of high ohmic resistance, to prevent leakage to such an extent that it will not produce noise on the line. Or a combination of two types of arrestors could be used; namely, the static arrestor connected direct to the line without fuses, and the

carbon arrestor connected through fuses to protect the instruments.

LOCATION OF PROTECTORS.

The most desirable location of protectors is no doubt, outside of the buildings, although the greater number of them are located on the inside, and apparently without very much risk, as the number of cases of disturbances from lightning and high tension circuit which would cause danger to buildings are very few. However, the best place to locate an arrestor, especially for protection against lightning, is on the pole. A very efficient way of connecting such an arrestor is to mount it on the cross-arm between the pin of the wires to be protected, connecting the carbon block directly to the line wire; and at this same point connecting the drop wire which is to enter the building. This drop wire, immediately after leaving the connection on the lightning arrestor or line wire, should be wrapped several times, either around the pin below the insulator of the wire to which it belongs or around the cross-arm before it is extended into the building. This you will observe gives you a high efficient choke coil that in case of lightning discharges, forces the current to ground through the lightning arrestor instead of permitting it to enter the building. If a fuse is desired, one side of this should be connected direct to the line wire, the other side can act as the terminal for connecting the one side of the arrestor and one of the drop wires.

The objection to having a fuse located on a pole is its inaccessibility. It is therefore recommended that for railway service the fuse be omitted on the pole arrestor, but that it be installed ahead of the instrument in the building. Another advantage of having arrestors mounted on the pole is that it permits a most direct and straight lead, as this is most desirable to take care of lightning discharges and prevents side flashing to quite an extent.

For ground leads iron wire is just as good as copper. Another objection to a fuse on a pole arrestor is that these arrestors are primarily intended to take care of the greater percent of static discharges which are mostly of such a character that they do no serious damage, only cause annoyance, and still are often severe enough to blow a fuse, which proves a source of great trouble and is of no practical service.

PROTECTING CABLES.

In the protection of cables, lines before entering cables should be provided with fuses to prevent excess current getting in and destroying the conductors; or charring the insulating material, which would reduce the insulation; where cables leave terminal boxes a loop or goose-neck should be formed, as it has been found that where lightning succeeds in entering a cable at a terminal box and there has been such a loop or goose-neck, the charge has nearly without exception discharged itself out through the sheeting at this loop or goose-neck, leaving a hole very much as though a bullet had been shot from the inside. It is better to have this occur at this point where the cable can be easily repaired or boiled out in case of water having entered, than to have it penetrate further in. Such blow-outs are generally caused by heavy discharges, which destroy the fuse and get beyond them.

In a study made several years ago, on damages done by lightning on cables of one of the telephone companies, it was found that this was a fact nearly without exception. In one case where the cables came straight down the pole out of the terminal head and went under ground, it was found that the discharge through the sheeting had taken place where it made the turn in the manhole and entered the conduit, making it necessary to pull out the cable to make repairs.

OTHER DISTURBANCES.

As we have made lightning protection the principal feature of this paper, we will just briefly mention other disturbances. Of course, such other disturbances will chiefly be induction due to paralleling circuits. Transposing of lines will take care of the ordinary disturbances due to adjacent telephone and telegraph disturbances. Such transposition will, of course, depend upon the paralleling circuits to be contended with. The most extreme cases to handle are paralleling high tension circuits, and especially if these high tension circuits are very close and have a large carrying capacity. We have met with cases where the induced effect from such circuits on a telephone line have been such that it has produced a current to ground direct from the telephone wire, of as high as three and four amperes; and in taking a volt meter reading to ground it has amounted to 200 volts, and in one case in attempting to take a volt meter reading it burned out the meter.

This will be appreciated when it is realized that a telephone wire being adjacent to a high tension A. C. transmission line is simply a good conductor direct in the magnetic field. The consequence is that the telephone wire will not only have a high static charge, but will also be a conductor of electro-magnetic current, being in reality one coil in a transformer. A very efficient way of caring for this trouble has been the drainage coil. This consists of a well balanced retardation coil bridged across the line, the center being connected to ground. These coils are connected at intervals along the line, depending upon the amount of induced current it is necessary for them to carry off. Of course, the wire in these coils must have enough carrying capacity to take care of the current to prevent burning them out. This coil also keeps down the static charge.

The President: You have heard the reading of this most excellent paper by Mr. Launbranch. It is one we are all deeply

interested in, and I should like to have a free discussion concerning it, and would be pleased to have all the members, if they have any question to ask Mr. Launbranch, or points they wish to raise, feel free to do so.

Mr. Camp: I would suggest, Mr. President, that Mr. Davis might give us some information on this subject.

The President: Mr. Davis, have you something to say on the subject?

Mr. Davis: Mr. President, I would be glad to, but so far as our company is concerned, we protect no telephones, and the protection of telegraph instruments is not particularly difficult. We do not lose a great many relays during the year, and the carbon arrester fills all our requirements amicably, I think, except we have had some trouble from arrestors failing to clear themselves, and, like all the rest of you, we are experimenting with forms of arrestors intended to obviate that trouble. We have a great deal more trouble from the blowing of fuses, and if there is anything exasperating in the telegraph business—of course, there is not, but if there could be—it would be the infernal fuses that blow when you don't want them to, and sometimes blow when our offices are closed for the night. For several years it has been our purpose to try to find a way out of this difficulty. If the power currents were always in large volume I should consider our lightning protection fairly good for our purpose. In the telephone service you have something very much more delicate and difficult to protect, and it comes pretty near being an easy statement to make by simply taking an arrestor that will serve the purpose of a telegraph company you may be quite on Easy street. The fuse question, if I may depart from the purely arrestors, is much more difficult. We use the cartridge fuse, and we use a great many of them—the subject of expense is not so important, but the interruption of the lines is extremely troublesome. We can protect, no question about that; we know how

to protect our plant against any condition that comes along—but if we protect it we cannot operate it, and there are sometimes things we like to operate. We have experimented with fuses of every device and form. The cartridge fuse has become very generally used in our company, and we cannot—we have not got to a point where it will absolutely protect our instruments. The relay won't carry quite as much as the fuse will, and so we are struggling with this same problem. This paper has given me the thought that possibly some of the arrestors of later type, this V-shaped arrestor, which we have not tried, or possibly the Brach, and we have been experimenting a little with the VAC-M arrestors, that something of the kind may furnish greater protection. But I don't know that I can contribute anything to the discussion beyond that we are protecting our offices with heavier fuses and we are protecting our instruments with a light fuse which is a little bit greater in its carrying capacity, that is, carries a little bit more current than the relays. If I can give any more definite information I would be glad to do it, but I think that is all.

The President: Mr. Sheldon, I believe you have had considerable experience with telephone train dispatching on the Union Pacific. Can you give us any information as to your experience with various phases of it?

Mr. Sheldon: Mr. President, the only trouble we are having at the present time is the difficulty the dispatchers are having with that light discharge coming in on them, cracking in the ear. They are all complaining of it, especially in the mountain district. We haven't anything at the present time to overcome that, and that is what we are trying to work out now.

Mr. Davis: Mr. President, may I say just one word? It seemed to slip my mind. The most important thing, if we could manage this question of accessibility—the place for the arrestors on the poles. I think we would like to have that.

Mr. Camp: Mr. President, as we are going pretty extensively into the dispatching of trains by telephone, I am anxious to get all the information I can at this meeting as to what the other companies are doing, and to start the discussion on those lines I propose to say what protection we are now using. At all our stations—at all our permanent stations, I should say—we are bringing our telephone wires in the form of loops, that is, we bring in both ends of both wires. Inside of the station we first connect with the Argus arrestor without fuses. Then on the leads from the arrestors to the telephone and selector apparatus we place an additional Argus arrestor on each side with a light fuse attached. At the dispatcher's office we also provide the Argus arrestors in the same manner; and in addition for the first three poles we place the O'Connell pole arrestor mentioned by Mr. Launbranch—but that doesn't seem to be sufficient to cut down the sharp click during the lightning storm in the dispatcher's ear, and I have had several complaints from our dispatchers on that point. So far we have had no trouble with the O'Connell pole arrestor. The poles containing those are provided with pole steps, so if a lineman or anyone else almost can quickly get up and clear out the space between the ground plate and the line plates. Now, if any of the gentlemen present have gone into any further protection than that, I would be very glad indeed to hear from them.

I received a couple of months ago a sample arrestor. I think it is the VAC-M you call it, I think.

Mr. Launbranch: Yes.

Mr. Camp: Got up in the form of an incandescent lamp. We are using that in our circuit up at Montreal, but cannot say anything as to the efficiency of it as yet. Our most severe storms are on the prairie. We have very little on the mountains, on the prairie it is especially severe, and we are installing the same circuits up in that territory this year, and I am very anxious to get any additional protection that can be advised.

The President: Mr. Forbes, you are located in the storm district up in Utah. I would like to hear something from you, especially protection from lightning for telephone service.

Mr. Forbes: I have very little trouble with lightning at all. I have had trouble—the lightning set fire to our switchboard just lately. Set fire to the switchboard in the Western Union office and burned us out in pretty bad shape all along the line, and in connection with that the carbon block arrestor melted off, but the fuse didn't burn on that same arrestor, which was something new to me. While we have considerable severe lightning at times—only short periods, though, in May and June—we haven't had any severe troubles yet. That is about the extent of my experience with it.

The President: Gentlemen, I hope you will not hesitate to enter into this discussion. We would like to have a word from anybody, your experience, or if you have any suggestions or recommendations to make.

Mr. Camp: I would like to ask, Mr. President, Mr. Sheldon what protection he is now using?

Mr. Sheldon: The O'Connell protectors we are using, especially on the prairie district, at all stations, and we have got them distributed on the lines about a half a mile out from the dispatcher's station, several of them. That hasn't worked as well as it might. The click is still there. The dispatchers get it. Over the mountain district we are using the Brach arrestors, in the district over the Rocky mountains where the lightning is very severe. Our protection is all right, so far as the protection is concerned, but the click is there. The dispatchers get them very severely, and I had in mind putting in some of the O'Connells on the poles also in that district.

Mr. Camp: Do I understand you to say, Mr. Sheldon, you put in the O'Connell pole arrestor at each station?

Mr. Sheldon: No—yes, the O'Connell pole arrestor at each station; yes, sir.

Mr. Camp: One on each side?

Mr. Sheldon. Yes, sir.

Mr. Camp: That doesn't help any?

Mr. Sheldon: No, the click is still there.

The President: Mr. Bennett, can you help us?

Mr. Bennett: Mr. President, my experience has been so closely like that of Mr. Camp and Mr. Sheldon that I cannot add anything new. We are using the O'Connell, just as Mr. Sheldon is, and we would like something that would be more efficient in taking out the click in the ear of the dispatcher.

Mr. Camp: Mr. President, Mr. Launbranch, I think, mentioned in his paper something about bridging across the two wires with retardation coil. I think that is pretty well taken care of with most of the selector apparatus that is put out now, the selector itself we place a 500 ohm retardation coil. Is that at least it is in the selector which we are using. Each side of the application you refer to, Mr. Launbranch?

Mr. Launbranch: No, what I referred to there was taking care of static current on ground lines.

The President: If there is no further discussion, gentlemen, I want to thank Mr. Launbranch in behalf of the association, for his most excellent paper, and it will be printed in the minutes, where we can all have an opportunity to study it over. I don't see Mr. Gilkeyson. I am very sorry. He is Superintendent of Plant of the Pacific Telephone Company. I would have liked to have heard from him. Are there any other telephone people here that we could hear from along the line of protection?

If there is no further discussion, gentlemen, it is now 12:30, before putting a motion to adjourn I would like to

mention that Mr. Lewis will tell us about the entertainment features for this afternoon.

The President: We had a recess a while ago to visit the exhibits, and I want to apologize for not mentioning the fact that there is located on the third floor the exhibits of the Western Electric, the Sandwich, the Kellogg, and Mr. Ghegan has in his room, No. 518, a new selector. I would like to have all of the members that are interested to visit these different exhibitions during the intermissions.

The Secretary: Mr. President, I notice our meeting is called tomorrow at 10 o'clock. We have lots of work to do and I would make a motion that we adjourn to 9 o'clock tomorrow morning.

Mr. Sheldon: I second that motion.

Which motion, on being put to a vote, was carried.

THIRD SESSION.

The meeting was called to order at 9:40 A. M. by President Dyer, Wednesday, June 22.

The President: We are working on the report of committees. Mr. Secretary, what have you ready,

The Secretary: Mr. President, I have the paper or report for proposed new railroad telephone agreement. Now, I don't know whether Mr. Griffith is here.

The President: Pass that for the time. I want a full attendance on that subject. What is the next?

The Secretary: There is one more paper on "Education for Efficiency in Railroad Service," by D. C. Devell, and Mr. Wm. Bennett is to read the paper, I believe.

EDUCATION FOR EFFICIENCY IN RAILROAD SERVICE.

Gentlemen of the Association of Railway Telegraph Superintendents: Never before in the history of our country has greater attention been paid to industrial education than during the past ten years.

Railroad managers, especially, have realized the need of educational work throughout their entire organization, and have from time to time attempted to accomplish something along this line. The attempts thus far made have been confined principally to the education of special classes of men employed in the shops. In some cases co-operative arrangements have been made with universities, business colleges, Y. M. C. A. schools or correspondence schools to secure their assistance in the education of special classes of employees.

It remained, however, for the Union Pacific Railroad Company to blaze the trail of real railroad educational work by establishing the first comprehensive educational plan for an entire railroad organization, viz: its educational bureau of information.

J. Shirley Eaton, in a recent monograph published by the United States bureau of education, and after an exhaustive study of present railroad educational plans, draws seven conclusions, which it would seem pertinent to quote, regarding education for efficiency in railroad service:

“(1) Railroad financial managements should incorporate an educational scheme as a definite part of their policy, on the ground of business prudence. Such policies should be inaugurated for periods of not less than five years, preferably ten: otherwise the money appropriated will be largely wasted.

“(2) Railroads should extend the principles of definite apprenticeship to every department of the service, and should pro-

vide for two or more grades of apprentices in order to take account of differences in capacity and work done elsewhere, either in properly accredited schools or by experience, and leading to different grades of service. Between these grades should be free movement, so that no individual should be arbitrarily designated to any class from which by his own effort he cannot advance (or by his own default automatically drop out). To assure this, the tenure in any apprenticeship status should be periodically tested.

“(3) There should be formal provision for movement among departments under proper conditions, and the comity of railroads should be so far extended as to formally provide for some interchange of officials under special restrictions.

“(4) In executing the policy of education announced by the directors, there should be a superintendent of education reporting directly to a higher official, such superintendent to be thoroughly informed of the educational policy of the railroad and the broad considerations on which it rests. His department should systematically recruit the employes throughout the service and certify, on request, to their records and general efficiency in the early stages of promotion.

“(5) Efficiency should be recognized by an efficiency wage, stated distinctly apart from the seniority wage.

“(6) Employes should be encouraged to take outside courses of instruction or experience without forfeiting their tenure, and, so far as possible, the educational department should systematically turn to account every outside educational agency, by suggesting courses, uniting in co-operative courses, and recognizing the work done in those courses, to the end that theory and practice be joined.

“(7) The educational opportunities of the service should be utilized to the utmost by encouragement of perfect freedom of study and criticism, and interchange of ideas concerning acci-

dents, bad work, and all the details of practice. Annual or semi-annual meetings of employes by classes of work, and the preparation and circularization of papers and discussions, should be a feature."

It will be noted in the following description of the educational bureau of the Union Pacific, which was organized some months before the publication of this government monograph, that the plan of the bureau conforms to all of these conclusions, except the second and the fifth, the practicability of which two are considered doubtful by many of our leading railroad officials.

The educational bureau of the Union Pacific had its origin in the idea of Mr. Harriman, that with the amount of mileage and the number of employes of the affiliated lines it never should be necessary to go outside of the organization for men to fill vacancies to which employes might be promoted if qualified; consequently he asked the officials of the different companies comprising the affiliated lines to work out some educational plan, whereby there would always be employes in the service ready for promotion when vacancies occurred.

There were no precedents for guidance in establishing this bureau. The industrial education of particular classes of employes was being carried on by some firms. A number of railroad companies, the Union Pacific included, had classes in arithmetic and mechanical drawing for shop apprentices, and in some cases special apprentice systems. The Southern Pacific had a course of training in railroad operation which had been in effect for four years. Their plan was to have a special class of from five to ten men, preferably college bred, and not necessarily employes. These men were put through a special course of about four years' duration, during which time they were paid from \$80 to \$100 per month. The course took up station work, track work, storehouse work, train service, yard service, dispatching, and trainmaster's work. At the end of the four years students were supposed to be qualified to take official positions.

The Union Pacific had contracts with certain telegraph schools to prepare students for the position of station helper. Railway wires had been cut into these schools and station forms were furnished. None of these plans, however, was broad enough to cover what was wanted, although it was decided that the education of station helpers, which had proved highly successful, was to be made a feature of the new bureau.

After a period of careful study on the part of Mr. Mohler, vice-president of the Union Pacific, Mr. Park, the general superintendent of the Union Pacific, but now vice-president of the Illinois Central, assisted by the heads of various departments and the writer—the bureau was organized on Sept. 1, 1909. In formulating the plans, two cardinal principles were kept constantly in mind: First, the bureau was to be for employes of all departments, each department being equally entitled to all benefits as far as his position and qualifications warranted, all instruction was to be free, and in no way compulsory—its aim being to assist those who desired to benefit by it. Second, the bureau was to be kept entirely separate from the general organization. It was to assist employes, but was to have no voice as to the advancement of any of the students. If a student desired to advance, it would depend, the same as heretofore, upon his immediate superior in the department to which he was attached. If he desired to advance in some other department, it would depend upon the recommendation and approval of those who had charge of the department concerned. ♦

It can be readily seen from the above that the idea was to eliminate favoritism and “pull” and let each man know that the opportunity was offered to *him* to prepare himself for better things, without regard to his station in life.

It was not the object of the bureau to make officials, but to make more efficient employes, from whom would naturally come those who were qualified to become officials.

The plans of the bureau, as announced, set forth the three principal objects which it was to accomplish: First, to assist employes to assume greater responsibilities; second, to increase the knowledge and efficiency of employes; third, to prepare prospective employes for the service.

It was further announced that the privilege of using this bureau was open to all departments and employes free of any charge, the company maintaining the bureau for the benefit of the entire service.

The bureau as organized is controlled by a board of supervisors, consisting of five of the general officers.

The bureau is directly in charge of the writer, who reports to the vice-president and general manager.

An advisory board acts with the chief of the bureau in handling all matters relating to the various departments, holding meetings each week, and enjoying the active co-operation of the vice-president and general manager and the general superintendent—the latter representing the board of supervisors.

The advisory board plans the courses of reading and study, passes on applications for courses, and assigns the work each student is to take up; approves questions answered by individual members of the board; advises the chief of the bureau on such matters as may be brought before it, and plans the policy to be pursued in handling new matters that arise from week to week.

The board is made up of a representative official from each of the various departments, such representatives being selected on account of their special fitness for the work.

The scope of the work now being carried out by the bureau will naturally have to be considered under the three primary objects which it is desired to accomplish.

ASSISTING EMPLOYEES TO ASSUME GREATER RESPONSIBILITIES.

Courses of reading and study especially prepared under the direction of the advisory board are being issued to cover as much of the "unwritten law" of railroading as is possible, and to include such existing instruction and written matter as will assist an employe to assume greater responsibility in the line of his work. Regular courses are offered in the following subjects:

- Telegraphy,
- Telephony,
- Maintenance of Automatic Block Signals,
- Interlocking Signalling,
- Railway Mechanical Engineering,
- Track Work in both English and Japanese,
- Station Accounting,
- General Accounting,
- Railway Operation,
- Freight and Passenger Traffic,
- Electricity in its various branches,
- Locomotive Operation,
- Air Brakes,
- Shop Practice,
- Car Building,
- Gasoline Motor Car Construction and Operation,
- Railway Civil Engineering,
- Refrigeration,
- The Analysis of Statistics, and
- Mechanical Drawing.

These courses are all conducted somewhat on the method of existing correspondence schools. Any employe is eligible to take

up one or more of these courses, and while employes are expected to take up a course that applies to their actual work, nevertheless, they are allowed, under certain conditions, to take up subjects in which they are most interested. Certain reasonable rules apply to the assignment of courses, so as to make the work of such a nature as will benefit both the student and the company.

It is not the intention to teach elementary or rudimentary subjects, such as arithmetic, spelling, grammar, etc., except in certain particular cases, like shop classes for apprentices, or where an employe is located at such a point that there is no other way for him to get this training, and the training of this man in the particular subject would be of benefit to the company.

All students are required to familiarize themselves with preliminary papers covering the history and geography of the road, before taking up definite courses.

Special papers are issued at frequent intervals to various classes of employes, whether students of the bureau or not. These papers deal with live subjects of general interest.

It was realized, when first planning the work of the bureau, that to meet these requirements, practically all instructional matter would have to be prepared and published by the bureau, there being practically no books issued that could be used for work of this kind. This was due to the fact that all instructional matter put out by the bureau deals specifically with Union Pacific methods and standards, is approved by the heads of the departments interested, and can be accepted by the student as authoritative information, applicable to his daily work. The lessons are divided into small units, and a set of questions accompanies each lesson. Written answers to these questions must be submitted, and must show a satisfactory understanding of the work before additional lessons will be furnished.

The lesson papers are prepared in outline by officials, or other employes of the road, who are selected for this work as a

result of some special fitness they possess to handle the subjects which are assigned to them. Material from which to prepare the Station Course, for instance, was in part collected as follows:

Outline of the subjects it was desired to cover in this course was made to certain station agents best qualified to write upon these subjects. These agents prepared papers on the subjects assigned to them, following which all who had submitted papers were called together for conference at the bureau headquarters. The papers were discussed and compared, and from the material submitted, selections and elimination were made until the nucleus for each of the several units of the course was established. From this, as a starting point, the subject matter is written up by the editorial department of the bureau to conform with a standard method of presentation.

Complete records are kept of the student work done by employees; and the names of those making good progress, together with their records, are furnished the officials interested.

A summary of the first seven months' work of the bureau as regards the results accomplished in this first object just described, will undoubtedly be of interest. It must be borne in mind, in this connection, that the proposition was a new one and the texts, in some instances, could not be put out as rapidly as students were prepared to receive them. It should also be remembered that—in view of the fact that the bureau was not in shape to handle an unlimited number of students—no attempt was made to urge employees to take advantage of the opportunity; all men receiving instruction have voluntarily applied for the courses which they have taken up. From Sept. 1, 1909, to March 31, 1910, inclusive, 937 employees enrolled for courses. In addition to this number, 15 relatives of employees were allowed to take up studies of various kinds, and 46 "outsiders," who were considered promising material for prospective employees, were given studies along the line of work they desired to take up when

they entered the service of the company, making a grand total of 998 receiving instruction up to March 31. A total of 1,422 lesson papers were sent in and corrected during this same period. The total enrollment of the bureau at this writing is 1,200, and lesson papers are being sent in and corrected at the rate of about 500 per month. Those enrolled are distributed among all the various departments, and all classes of employes are received, from laborers up to officials of the rank of assistant superintendents. The most popular courses are those in Signal Work, Railway Mechanical Engineering, Track Work, Station Work, Traffic, Accounting, Railroad Operation, and Railway Civil Engineering. Twenty-eight regular courses are in the process of preparation, and more may suggest themselves as the work progresses.

In connection with this part of the bureau work, men selected for advancement to minor official positions are afforded an opportunity, before their final appointment is made, of acquiring a knowledge of the practical workings of departments with which they have not been intimately connected. This is accomplished by securing such employes a temporary connection with the various departments, under the direction of the heads of such departments, and at a salary fixed by the board of supervisors.

INCREASING THE KNOWLEDGE AND EFFICIENCY OF EMPLOYEES.

In order that any employe desiring information, on any particular question or problem that arises from day to day, can obtain such information promptly, it has been arranged that such question or problem may be sent to the bureau for an answer. There is no formality connected with this matter; all that is necessary is that the employe mail the question to the bureau. The information requested is furnished through the bureau in a simple, practical manner, as promptly as possible. All answers are passed on by the advisory board, thus insuring the accuracy

of the information so furnished. As the bureau has its own telegraph office, officials can get information direct by wire, using cipher code if desirable.

In cases where questions asked the bureau are of such a nature that the questioner would be benefited by practical demonstrations or personal instruction, arrangements are made either to bring the questioner to a point where he can be given authoritative and thorough information on the subject, or to have a representative of the bureau call on this man and give the information personally; e. g., questions on filing systems have been asked and the questioner has been brought to headquarters, where he could familiarize himself with filing systems in effect in the different offices. To make sure that the questioner has absorbed the information, it has been a practice to make such a man write a report of his observations in a case of this kind. This serves the double purpose of giving assurance that the man has profited by his opportunity and at the same time puts on record information that will answer similar questions that may be asked in the future. In other cases the test department has been asked to arrange apparatus to demonstrate practical problems which the questioner has had difficulty in understanding.

While this part of the bureau work has not met with the response that was expected, it is, nevertheless, an important adjunct to a proposition of this kind, and serves a useful purpose in allowing certain classes of men who want information about a few practical points connected with their work, to obtain this information without going through a long course of study necessary by other methods. It is well to observe that this feature is separate from the ordinary correspondence school feature, which allows students to ask questions about their lessons, the questions about points in the lesson being answered by the instruction department in the regular routine of the instructional work.

PREPARING PROSPECTIVE EMPLOYEES FOR SERVICE.

In order not only to increase the efficiency of the men in the service, but at the same time to improve the class of men taken into the service, it was decided that the bureau should assist in whatever way possible in selecting and preparing prospective employees for the service. It was not intended that any official should feel that his help must be hired through the bureau, but it was felt that if the bureau could keep in touch with good material to fill minor positions, the officials would be glad to take advantage of such an opportunity to get a better grade of help into their organization. With this end in view the bureau keeps in touch with universities and other schools, and with such other sources of material as produce good men for minor railroad positions. In a great many cases applicants for positions with the road are referred directly to the bureau, and all applications received by the bureau are carefully investigated by it as to personal history, references and physical qualifications of the applicants, so that the bureau is practically assured, when recommending a man for a certain position, that the man can pass both the physical examinations and the mental examination, and has a good character and a clean record. In certain cases where prospects of this kind show up well, and it is expected that they can be placed in service at a not too distant date, they are allowed to start in studying on the history and geography of the road, and even on the more advanced courses along the lines of the work in the field which they desire to enter. Since the bureau was established, 388 applicants for positions with the company have been investigated, 13 of these have been recommended for positions, 36 of these having been put into the service. This is exclusive of station helpers. In all cases of applications for employment, preference is given to those coming from relatives of employees.

The bureau does not solicit positions for any of these applicants, it being understood that a request will have to be made to the bureau if its assistance is desired in furnishing help, but

the bureau is glad to assist in any way possible, when requested to do so. It is also understood that the interest of the bureau in the men furnished ceases when they are employed, unless they later take advantage of the privilege of the educational features of the bureau work.

Applications of experienced railroad men, when received, are looked up by the bureau, and if their records are satisfactory their names are placed on file, so that in case it should be necessary to go outside of the organization for help of this kind the bureau will have records of suitable men. It is expected, however, that all positions of this kind will be filled from our own ranks, and with this end in view the names of students making marked progress in their studies are placed before the general superintendent, so that, in this way, men who are available for promotion will have a better chance to connect with vacancies which they may be qualified to fill when the opportunity is offered. This obviates to a great extent the necessity of ever going outside of our own ranks for men to fill advanced positions.

In addition to the foregoing, there has been established under this third object a station training school at the bureau's headquarters for the preparation of station helpers who will be available for promotion to operators. This feature of the work, gentlemen, is of particular interest to you.

Conditions met with on the Union Pacific, in common with other roads, in obtaining satisfactory material from which to make operators led to the experiment of making an arrangement with telegraph schools along our line to furnish their graduates for our station work. Such arrangement was made some two years before the establishment of this bureau. These contract telegraph schools were furnished with main line telegraph wires. Station blanks and forms were also furnished, the authorities of the schools agreeing to teach the station work to their telegraph students. The company appointed an instructor to make regular

visits to these various schools and to keep in touch with the situation and also to assist the students after they got out on the line. The results obtained, while more satisfactory than before any systematic effort had been made to recruit material for operators, had many objections, the principal objection being that the schools would not teach the station work properly. When these students were sent out it was found they were of but little assistance to the agents, and the agents would not help them with their station work nor give them much opportunity for practice on the wire. Our figures show that we lost about 50 per cent of all such telegraph school graduates before they had served long enough to be promoted to operators. When the bureau was established, plans were immediately made to organize a station training school in connection with the bureau work. With the active co-operation of Mr. Sheldon, our Superintendent of Telegraph, a model local freight station was equipped at the bureau headquarters; main line wires were cut in; the station posted as a regular telegraph office, both for railway and Western Union business; sounders connected to the main line circuits were distributed about the room; practice circuits were arranged; a regular station switchboard and cut-out plugs were provided; and a five-station telephone dispatching circuit, with the dispatcher's selector set, was installed. In addition to this, a complete set of regular station forms and record books, letter presses, tariffs, baggage checks, tickets, etc., etc., were provided. One of the older station agents who had had particular success with station helpers was selected as the instructor, and a regular course of training was outlined for the students, five hours a day being devoted to station work and three hours a day to copying off the main line wires or to sending and receiving on the practice circuits.

Telegraphy is not taught in this school, no one being admitted who cannot receive at least twenty words a minute. Candidates for admission must also be 18 years of age and must have had a

good common school education, as proven by their ability to read and write legibly, and to figure simple arithmetical problems correctly. They must also pass the required physical examination before being admitted to the school. A course of training is laid out for the student on the basis of four weeks' attendance. This course takes up in a regular order all the simpler station work, such as the making of bills of lading, the making of way-bills, a correct understanding and use of the tariffs, copying, abstracting, baggage and ticket reports, etc., etc. Experience has demonstrated that in four weeks the average student becomes well informed in the simpler routine of station work. Some time during the course he is sent to the freight house at Omaha, and is given two days' experience in trucking, piling, stowing, checking and receiving freight in actual service. This school has an average attendance of about twenty students, which has proven sufficient to supply the needs of the entire Union Pacific system, practically all station helpers being furnished from this school. During the first sixty days of its organization 37 students had been in attendance, 19 had qualified and been sent out as helpers, and 18 were still in attendance at the school. Of the 19 who were sent out to qualify as helpers, three were promoted to operators within thirty days of the time they had left the school, none of the three having had any previous railroad or telegraph experience. From present indications there will not be more than 10 per cent of the men trained in this station school who will drop out before being promoted, as against 50 per cent by the old method. The saving made in sending out trained men for these positions will more than pay for the comparatively small expense of maintaining the school. The success of this work has been such that every Superintendent of Telegraph who has had trouble in getting efficient operators, or material from which to make operators, should be greatly interested in investigating the work being done in this station school, and I take pleasure in joining Mr. Sheldon in extending an invitation to each of you gentlemen to visit this school at Omaha at any time.

In addition to the plans which are under way, and which have been described, numerous other plans for practical educational work among the employees are under consideration. It is expected that local classes will be organized at various points on the line. It is the intention to have a lecturer on the road equipped with stereopticon and lantern slides, who can stop at various points where students are located and lecture on various propositions connected with the work. The bureau also expects to co-operate with the present apprentice classes which are being successfully conducted by the motive power department at the larger shops, and assist in establishing apprentice instruction at some of the smaller shops. An extensive library of scientific and technical books is being established at the bureau headquarters, which is expected will be available for circulation among employees.

It was stated early in the paper that men selected for advancement to minor official positions would be afforded an opportunity, before a formal appointment was made, to acquire a knowledge of the principal workings of such departments as they had not been intimately connected with, through a temporary connection therewith, under the direction of the heads of such departments, and at a salary fixed by the board of supervisors. This might be likened to the post-graduate course of the ordinary university, or the winning of a scholarship. The practical working of this plan can best be explained by an example of how it is actually being put into effect. One of our trainmasters had shown by his work that he possessed qualifications that would ultimately assure him promotion: in fact, he was selected as a man who later would be promoted to be an assistant superintendent. He was relieved from service as trainmaster on his territory and is now taking this course of training at his same salary. This course will embrace three months' work on track as a laborer under a competent foreman, three months' work as a handy man in the roundhouse and back shop, two months in the auditor's office, at the desk where the mistakes made by passenger and

freight conductors pass, one month in the station school, his training ending with a couple of months in the general offices. At the end of his training this man may be sent back to his original position as a trainmaster, or may be put in a similar position in some other territory, but wherever he is placed, he is an employe who has been proven in actual service and trained for promotion when the first vacancy occurs. Men from other departments are receiving similar opportunities.

The expense of the bureau, which is quite reasonable, is divided between the various departments, so that the proportion of the expense borne by each is nominal.

CONCLUSION.

While it is impossible to show in dollars and cents the value that is derived from this educational plan, it is plain to see that a scheme of this kind founded on practical principles is bound to create increased loyalty throughout the organization, is certain to set a number of the employes thinking upon and considering problems connected with their everyday work which they would otherwise pass over without proper attention. It will bring out the latent good qualities of employes, making them more efficient and capable workers; it is producing a supply of qualified men who can be promoted to fill vacancies as they occur, and at the same time it is giving a wider field from which to draw promising material into the service. Six months ago it was an untried experiment; today it is an assured success, receiving the support and approval of the entire organization. It is increasing the safety of travel and making better citizens for our commonwealth.

The President: I consider this one of the most important papers that has come before this convention. It is one that we should thoroughly discuss and follow on our respective lines as much as possible. I believe there are similar arrangements on

other railroads, and for the benefit of the association I should be glad to hear from any of the members that have had to do with similar arrangements. I have in mind no one in particular. I should be glad to hear from any of you. I believe the Southern Pacific has gone into this proposition to some extent, and I know in Los Angeles they have a school we consider a training school, under the managership of Mr. Mackay. I would be glad to have Mr. Mackay give us a few words in regard to the system employed in the Southern Pacific school at Los Angeles, or other places if they have schools. Mr. Mackay, of the Pacific Coast Schools of Railroad.

Mr. Mackay: Mr. President, Gentlemen: This is rather unexpected. I am a plain telegraph operator and not really accustomed to addressing a collection of gentlemen in your positions. We have been conducting this school for three years, and, for the information of the strangers present, I will say that the school has the co-operation of the Southern Pacific Railway Company, but it is not actually conducted by the company. I am an old Western Union operator, came out here three years ago, and at that time I was approached by Mr. Roome, who was then Superintendent of Telegraph on the Southern Pacific, in connection with establishing a training school for telegraphers. I accepted the position and in about a year it was discontinued, through a suggestion of my own, because I really did not make enough money out of it.

Now, in regard to results: I have not prepared any exact figures, but I made out my permit for physical examination this morning, and it was 347, and I began at No. 1. Now, as a guess, I should say that 47 of those were rejected, the other 300 being accepted, and I have kept pretty good track of the boys, and I estimate that 250 are now in the service of the Southern Pacific Railroad Company, but not all as telegraph operators, but I think, as a conservative estimate, there are 100 of them employed by the Southern Pacific Company as telegraph

operators today, and who started three years ago. Now, the balance of those boys saw better opportunities in other branches of the service. Some are in the train service, and others have become baggagemen, and I know of one at least who is a chief clerk, a young boy who started out at \$40 a month. So I can say that in three years there are nearly 250 men in the Southern Pacific service who have gone through our school, and I think that is a mighty fine showing.

And in regard to the telegraph school, we have started the boys from the beginning. We also accept advanced students, and in fact many telegraphers. Now, in regard to the interest railroad men take in this state, I can say, for your information, that there are about ten station agents down at my school now. One young man who has been with the Southern Pacific for ten or fifteen years came all the way from Mexico, from the Sonora branch of the road, forfeited his salary, got a leave of absence to come to my school. He wished to become efficient in stenography and typewriting and telegraphy, and the use of the typewriter in connection with telegraph work. The other boys come for the same reason. In fact, our boys are scattered everywhere. Found one of my boys in the exhibit room yesterday. He is a graduate from our school, took a post-graduate course. He was a commercial operator, desired to take up railroad work, came there, took up typewriting and learned the railroad end of it, the rules and regulations.

Now, the one thing that we need in our school is station work. I am not a practical station man myself. I believe I held a station about ten years ago for a few months, but I claim very little knowledge of station work. In conversation with Mr. H. W. Lyon the other day, the supervisor of station men on the San Joaquin division, he spoke of that, and he said that while he had not enough influence to suggest the thing or to bring about such an arrangement, he said it would undoubtedly be a fine thing if it could be arranged to have an auditor come to our school

about two afternoons for two days per week and instruct these boys in the station work, and my experience and acquaintance with station men, and also officials, have also made me feel the need of this training in station work.

Now, we have the main line wires in the school. I have a branch in Sacramento and I have had a great many letters from employes that as a matter of fact the boys don't seem to be able to stand the expense of getting leave of absence and coming to the school, although I make every effort to assist them. For railroad employes, the best I can do at present, as you can imagine my expenses are somewhat heavy, for I have several instructors, and the best I have been able to do, or the best proposition I have been able to make thus far to railroad men is a reduction of 50 per cent admission fee, and when you consider we have forty or fifty typewriters in the school, four instructors, and other expenses, \$10 per month is a nominal fee—railroad men are permitted to attend for \$5 a month. I should say I should think that possibly 20 per cent of my students are railroad men, but I have a great many applications—I have had a great deal of correspondence with railroad men throughout the entire system who would like to come to school, but who are not permitted for financial reasons.

The President: Mr. Mackay, may I ask you if you teach any other branches besides telegraphy?

Mr. Mackay: Just telegraphy, railroad and commercial telegraphy, and stenography. As a matter of fact, the demand for my stenographers is so great that since it has become known we are turning out first class stenographers and men who have had some experience in railroad work I am not able to supply the demand.

The President: Then I understand the graduate from your school is qualified to accept a position as a telegraph operator or a station agent?

Mr. Mackay: No, sir, not as a station agent. That is the thing we lack and we should teach. Personally I am not qualified to teach station work, and the receipts of the school won't warrant another instructor—an instructor for that department. But I believe that two days per week devoted to station work would be sufficient to give these young men sufficient knowledge of station work to be of material assistance to the agent. Of course, it is a little bit out of place for me, a private individual, to make any such suggestion to you gentlemen, but my experience has really given me that idea—that opinion—and I just make it because I was invited to express an opinion. I hope you will not think I am going too far.

The President: We are certainly glad to have your statement.

Mr. Mackay: Any questions you care to ask, gentlemen, I would be glad to answer you.

Mr. Griffith: Mr. President, I just have a few words. We have been hearing what is being done on the Pacific, now let me tell you what we are doing on the Atlantic. On the old reliable, the Erie, we have a very excellent school, located at Elmira, N. Y. It is equipped with a railroad in actual operation, single, double track, sidings and branch lines, manual block signals and interlocking, equipped with telegraph and telephone, including the selectors. It is conducted by one of our most expert chief train dispatchers for the operating department, assisted by one of our experts from the traffic auditing department, to teach them the station work. The railroad is run by electric power, on which the dispatcher takes his regular position on the line and the boys are placed at stations, just the same as they would if they were on the railroad out in the woods, and everything is conducted in the same manner as it would be in actual operation. We also have every station equipped with a six wire switchboard, which teaches the students telegraphy. We also have the actual

manipulating of the telephone service. And at certain periods the heads of the various departments of the railroad assemble these students in the assembly hall of the institution and give them a lecture on the particular department which they represent. I think it is a most excellent institution of its kind, and we have turned out several hundreds of students who are in actual service today.

The President: It seems that Brother Griffith has the ideal school for telegraphers and agents. I don't know what improvement could be made on the system of teaching, unless you would put them right in an office.

Any more remarks on this paper? The additional branch of teaching students the use of the telephone in train dispatching seems to me a good addition.

Mr. Knowd, were you present at the reading of this paper by Mr. Devell on "Education?" It relates to the education of employes for the various departments of a railroad. We would be glad to hear from you as to what extent it is being practiced in your territory on the Santa Fe in regard to teaching students as prospective operators or agents or to take up other branches of work on the railroad.

Mr. Knowd: We pursue practically the same course on the Gulf lines of the Santa Fe as is observed on the lines in the Atchison proper. In the relay service, that is, speaking of the general message service, we employ one student, rather an apprentice operator, to each five operators. Half of their time is devoted to learning telegraphy and the remainder to learning the duties of the office and general message handling. At the various stations on the line half of the time is devoted to the learning of telegraphy, and the remainder to mastering station work and that line. We have sort of an agreement obligating ourselves, or the company, to furnish employment as soon as the apprentice is capable. Thus far we have had very good results, better than

we could expect from the transient operator, especially in my territory—there are a great many places in Texas and western Louisiana where it is difficult to keep operators. We find by making our own men that they stay with us and are more amenable to our requirements than the transient who comes for a short time only. The first year we pay the apprentice operator \$20, the second year we raise that salary \$5. Upon graduation we pay \$5—we call it bonus—for each month that they serve. That in a measure is put forth as an incentive that when an operator is ready to graduate he has possibly, or will have acquired, all the way from \$50 to \$100 to start him out in good shape. We find that feature very desirable.

The President: I would like to ask what preliminary examination you subject the applicant to in regard to his education or physical qualifications?

Mr. Knowd: In an educational way only general questions; in a physical way we maintain a regular hospital association, and each employe—operators—are subjected to practically the same examination as the trainmen. It is not simply confined to examination of the hearing and vision, but it is general, and it is carried on by the company physicians. Sometimes I feel that it is a little strenuous to subject an operator to the same examination that is called for by trainmen, because their duties are not as arduous and not as hazardous—the vision and the hearing and general good health, I think, possibly are all the essentials that we ought to exact.

Mr. Bennett: Mr. President, although I read the paper, I am not the author of it, and so I feel I am privileged to say something regarding it. Until about a year and a half ago, for eighteen years I was in the service of the Santa Fe and the Northwestern systems as a trainmaster and assistant division superintendent, and division superintendent, and prior to that I served the Southern Pacific Company on the At-

lantic systems for four years as a brakeman and conductor. I have found the trainmen, when I lived among them and ate and slept and worked with them, to be human beings, just like everybody else, and in the main a very good lot of American citizens. But the thing that struck me most, after having had considerable experience in various lines of railway service, and being an operator and chief train dispatcher, then on coming into the railway service, was the fact that train and engine men had forgotten what little education they had. As the little colored girl gave it, "They are just drug up." I remember a remark by a very efficient conductor one day on the Atlantic system, speaking about a young man I thought might get a position as a brakeman. He said, "I don't think he will do. What we want is a man that is strong-backed and ignorant," and he turned around and made this remark: "I want to tell you, William, that a good railroad man is the man that knows enough to do what he is told and then stop." And he really got wound up to that visionary business. How often have you gentlemen lately heard officers responsible for the railroad going say, "Nowadays you have got to write a thing down and hand it to a man in your office, or bring it to him and tell it to him, and have him repeat it back to you. You can't depend any more on the judgment and discretion or common sense of the subordinate employes of a railway." That is largely true, but it is largely the fault of the railway operating officers. I think it is true and to some extent for financial reasons. Railways have not thought it necessary or desirable to make any inroads on their earnings to educate their employes, but for a number of years past we have found that we are losing a lot of money because we don't do it. You would be surprised to find how little many a brakeman and fireman know about their work: how many dollars they waste because they don't know about it: and particularly in the passenger service how many train employes drive patronage away from their railway companies be-

cause they have never been properly taught how to perform their duties. They may be willing, but they have not been taught. They are ignorant about a lot of things they ought to know about, and that drives people away. For instance, you want to know how to ventilate a car, because railway cars are not well built for that object, but some brakemen can do it more skillfully than others because they have been taught by experienced conductors that they have worked with. Another brakeman causes an accident because he does not know how to handle the air whistle or the air brake. And the fireman uses an enormous amount of coal and doesn't get anywhere, because he doesn't know how to shovel coal into the firebox; and the engineer will put out his head and tell him to stop; he doesn't want the firebox so full. Meanwhile the fireman is sweating himself to death and breaking his back trying to see how much coal he can get into the firebox. These are simply illustrative of the way things go. This paper presented to us by Mr. Devell is a very fine thing. It completely describes a dream I have had for the last seven or eight years. Our people are getting interested in it, but whether they will get interested enough to open up their pocketbook I don't know. It is hard to get the railroad management to spend some money to save some loss. They don't know how to estimate as to their value and the loss it really means to the railway company. That is the difficulty.

Now, I think Mr. Devell's paper is entitled to a great deal of careful consideration on our part, and it would be a good plan for all the telegraph superintendents to study this educational matter. We are interested, not only in the telegraph matters, but in the whole operation of the railway, and the telegraph operation is only one part of the railroad.

The system which they have on the Union Pacific is a grand idea, a splendid thing. There is no class of employes in the whole railway service but what can be made more efficient if when they enter the service they gain a training for their business.

Nature gives us all more or less natural simple intelligence, but all of those of us who have lived along to middle life know that the trained intelligence is very much more useful than one which is simply a gift of nature and has not been trained.

The President: If there is no further discussion——

The Secretary: Mr. President, I just wanted to suggest, in regard to this paper, it being such an excellent paper and so greatly interesting to us all, and especially the larger systems, it occurred to me it would be a good idea to have several of these copies of this paper printed. If we put it in our book it will be covered up. I don't know whether the other members would think that of importance enough or not, but it seemed to me it would be well to have several of these typewritten and sent to the different Superintendents of Telegraph. Of course, the associate members do not care so much about it, but the active Superintendents of Telegraph, it seems to me, it would be a good thing to do that.

The President: As a matter of fact, we would be glad to have the officials read these minutes, all of them, get in the habit of reading them and know what we are doing and having these conventions for.

Mr. Sheldon: Mr. President and Gentlemen: In behalf of the Union Pacific I would be glad to co-operate with Mr. Devell to have these printed in pamphlet form and distributed to all the Superintendents of Telegraph.

The President: The next paper, gentlemen, is the committee's report on proposed new railroad telephone agreement, which will be read by Mr. Griffith.

Mr. Bennett: I rise to a point of information. Would it be advisable to request any others than associate and active members to withdraw during the reading of this paper?

The President: I think not. An executive session would confine the meeting only to active members.

Mr. Bennett: My idea was that the associate and active members would be present, of course, but I didn't think we wanted any newspaper reporters.

Mr. Griffith: I believe, Mr. President, that the paper is of such a nature that its publication will have no effect on the result, and I should like to have a free discussion of it from anybody, associate members particularly.

The President: Mr. Bennett, if you have no serious objection we will proceed.

Mr. Bennett: I am at the pleasure of the meeting.

(Paper read by Mr. Griffith:)

Committee report on proposed new railroad telephone agreement, to be read by Mr. E. P. Griffith:

Mr. John L. Davies, President, Association of Railway Telegraph Superintendents.

Dear Sir: At the regular quarterly meeting of the Eastern Division of the Association of Railway Telegraph Superintendents held in Washington, D. C., Sept. 18, 1909, the "Standard Telephone Operating Agreement" for railroads was taken up for discussion. After listening to the telephone company's representatives' explanation of the agreement, and considerable discussion by the members present, it was agreed that a careful analysis of the proposition should be made by a committee of five, who should report their conclusions to either division or in annual meeting.

It is clear to the committee that the document in question is ably prepared with a view to standardization and to meet any existing laws or contemplated legislation with respect to discrimination, and at the same time, provide amply for railroad telephone service. Particular care is taken, in every clause of the agreement, to state that the rates to be applied shall be the

regular charges of the telephone company to its business subscribers and lessees in similar service, under substantially similar conditions. It takes away nothing that we now enjoy, except possibly a few comparatively low rentals for apparatus, which would be more than offset by the substitution of the flat rate for measured service at a few points where the railroads, under the present Standard Telephone Agreement, are placed on a measured basis and other subscribers or lessees in similar service under substantially the same conditions, have a flat rate.

It permits the use of any apparatus the railroad company may elect for use on private lines, not connecting with any public or private branch exchange, or mileage line furnished by the telephone company. It requires the railroads to use only apparatus approved by the telephone company when such apparatus is for use on lines likely to be connected with their system. There is no objection to such restriction, if it can be termed a restriction.

The commercial department of the American Telephone and Telegraph Company, Mr. George W. Peck and Mr. F. A. Baker, in particular, have been untiring in their efforts to aid your committee. They have furnished us with extracts and marginal notes showing how each phase of our service, under the present contract, would be taken care of under the proposed new agreement.

The standard railroad contract, under which most of the railroads are now operating, was introduced nine years ago. Great progress has been made with the telephone in railroad service since that time, and possibly the conditions of today may require some readjustment of the old agreements. The standard telephone operating agreement, otherwise known as the new agreement, which is now before you for consideration, was conceived, we believe, about two years ago and brought before this association at our last annual meeting in Detroit. The new agreement is presented now as originally prepared by the telephone company

Within the current year a new and important feature has entered the telephone and telegraph field. The telegraph company which controls the lines on a majority of the railroads represented by this association is working in harmony with the American Telephone and Telegraph Company, or the parent Company, of the various telephone systems, forming a part of the proposed new agreement. Within the past few months we have noticed, and we believe, all classes of business, or users of the telephone and telegraph, will agree with your committee, that the development of the telegraph and telephone, under such harmonious workings, has been a great benefit to the public generally. If such benefits show themselves so conspicuously under a few months of operation, it is hard to estimate what the development will be within a year, or two years. It is therefore, Mr. President, the conclusion of your committee that this association should postpone action on the acceptance of the standard telephone operating agreement for railroads until the telegraph and telephone companies have further developed their traffic arrangement, in order that we may be in a better position to judge as to what form of agreement will be best adapted to the service of the various railroads. When such time shall arrive, a committee representing this association, can meet, in joint session, with a committee representing the American Telephone & Telegraph Company, and formulate an agreement suited to the new conditions.

Yours truly,

E. P. GRIFFITH,

Superintendent of Telegraph, Erie R. R. Co.

L. B. FOLEY,

Superintendent of Telegraph, D. L. & W. R. R. Co.

J. S. JOHNSON,

Superintendent of Telegraph, Penna. R. R. Co.

A. B. TAYLOR,

Superintendent of Telegraph, N. Y. C. & H. R. R. R.

N. E. SMITH,

Superintendent of Telegraph, N. Y. N. H. & H. R. R.

Mr. Griffith: Now, gentlemen, since your committee agreed on this report your chairman has had an interview with the telephone company and we have learned something which I believe should be a part and published as a part of the committee's report, and with the sanction of the rest of the committee, I will read it and make it a part of our report:

Since this report was written, the chairman of your committee had an interview, in New-York, with the General Commercial Superintendent of the A. T. & T. Co. and was informed by him that so far as he could see nothing had transpired under the arrangements for the interchange of facilities between the American Company and the Western Union Telegraph Company, which would make necessary any change whatever in the new general railroad agreement. Your chairman was also informed that there are a number of railroads, some operating under the old railway contract, which for one reason or another, desire to immediately negotiate the new agreement with the telephone companies.

Under these circumstances, it seems proper for your committee to suggest that any railroad desiring to adopt this new agreement, should do so for the period of one year, which period, your committee understand from the telephone companies, will be agreeable to them. In this way, the new agreement will be tried out by actual experience, which experience will be of great value to our association and the railroads.

Mr. Bennett: Mr. President, not with the purpose of opposing any regulation of the committee, but rather to start an active and intelligent discussion of this report, I move that in view of the report of the special committee, it is the sense of this association that the new agreement, the standard telephone operating agreement for railroads, offers an equitable and comprehensive substitute for the old, or standard, railroad contract, for immediate negotiation by the railroads as may be best suited to their respective needs and circumstances.

The Secretary: I second that motion. I wanted to state that we have not any of those agreements, that is, a copy of them. I can't find any in the secretary's correspondence here, and I don't know whether all the members know what that agreement is or what there is of it.

The President: I am under the impression that they were pretty well distributed. I have received one and I know nearly every one I have talked to has had them.

Mr. Tripp: I for one have not seen them.

Mr. Bennett: Mr. President, they were quite freely distributed by mail a year ago, and I have received some since. I don't know to what extent the other gentlemen have seen them, but probably enough have seen them to enable them to now debate the motion.

The Secretary: I will say, Mr. President, that I am in favor of this motion, and also of the contract, and I think it is the proper time now to take up this matter.

The President: Mr. Tripp, you understand this is not a new proposition, it is the new agreement that was circulated over a year ago and presented in the Detroit meeting.

Mr. Tripp: I thought if there were any copies obtainable I would like to get one.

Mr. Mintum: I will get all the members a copy right away.

Mr. Bennett: I wish to make a personal explanation—the fact I overlooked the President having put that motion to a vote and the motion carried. I spoke about it being debatable.

The President: I haven't called for a vote.

Mr. Camp: Will the secretary kindly read over that resolution again of Mr. Bennett.

The Secretary: (Reads the resolution presented by Mr. Bennett and handed to him.)

Mr. Camp: Mr. President, I would move an amendment to that. At least I wish to make an amendment to it to the following effect: "That the report of the committee be received." This would leave it entirely optional with any railway company to make or to enter into the new agreement without binding the association to an expression of opinion. I think that would be more desirable than for this association now to decide in favor of the contract. If I have a second.

Mr. Griffith: I second the amendment.

The President: Gentlemen, the amendment by Mr. Camp is that the report of the committee be received. We will vote on the amendment—

The Secretary: I don't see that this resolution of Mr. Bennett binds the association to any agreement at all. It just simply recommends—exactly what you offer—it recommends that this standard agreement be adopted by any road that would choose to make it, that is all. Now, the road that I represent, we are waiting to have this thing settled so that we can make a contract. We have just been waiting for this matter to get the approval of the association. I don't see anything that would interfere in any manner with any road that doesn't want to accept it, don't have to do that, just simply recommends it is the sense of this association that they approve of that.

Mr. Bennett: Mr. President, as I understand this situation now parliamentarily, the motion as amended would read somewhat like this: Move that the committee's report be accepted, and it is the sense of the association that this is an equitable and comprehensive substitute for the old contract ready for immediate negotiation by such railways as are waiting to negotiate a contract or agreement, according to their particular individual needs. That is the way I understand the motion and the amendment together. Of course the amendment must be debated and disposed

of first, as to whether it is necessary to have that added to the original motion.

Mr. Camp: Excuse me, Mr. Bennett, I don't quite understand my amendment to read that way. As you put it it does bind the association to an expression of opinion on the contract. I did not gather that from the committee's report. Am I right, Mr. Griffith?

Mr. Griffith: The association as a whole leaves it open as to any individual.

Mr. Camp: That is, the association as a whole. The supplementary part of Mr. Griffith's report offered a recommendation that such railways as desired might accept this new agreement for a year, and my amendment was to carry that into effect without binding the association definitely to an expression of opinion on it at the present time. That was all.

The President: Any further discussion, gentlemen?

The Secretary: Mr. President, I can't see any real objection to the association expressing their opinion in regard to the contract. And this motion does not continue the committee for any special report in the future, and I will also offer an amendment to the amendment that the committee be continued for reports for the next year, also further report at the next meeting.

The President: Any further discussion, gentlemen? If not, we will vote on the amendment to the amendment. Will you accept that to your amendment, or shall we——

Mr. Camp: Well, I will accept, with my second's permission, that my amendment shall read "The report of the committee be received, and the committee continued." Will you agree to that?

Mr. Griffith: Yes, that is all right.

The President: Now, gentlemen, we are voting on Mr. Camp's amendment to the effect that the report of this committee be accepted and the committee continued.

A Voice: Pardon me, didn't the gentleman's motion read that the report should be "received?" There is a difference between received and accepted.

The President: Thank you for the correction.

A Voice: Does Mr. Bennett withdraw his motion?

Mr. Bennett: I would say for the gentleman's information, that I made a motion, Mr. Camp moved an amendment to my motion. That is all that is under discussion now—the amendment to my motion. When that is disposed of we will take up my motion.

The President: We will now vote on the amendment of Mr. Camp that the report be received and the committee continued.

The amendment was carried.

The President: Now, we will vote on the original motion by Mr. Bennett.

Mr. Griffith: Will you please have the motion read as amended, Mr. President, so we will all know.

The President: The Secretary will please read the amended motion.

Motion: That the report of the committee be received and committee continued and—

Mr. Bennett: In view of the report of the Special Committee, it is the sense of this association that the new agreement or "standard telephone operating agreement for railroads" offers an equitable and comprehensive substitute for the old, or "standard railroad contract" for immediate negotiation by the railroads as may be best suited to their respective needs and circumstances.

Seconded by Mr. Van Etten. Carried.

The Secretary: Mr. Camp's amendment there does say that the first resolution—he moved that it be received.

A Voice: That was my understanding, that Mr. Camp offered to substitute a motion there and not an amendment.

The President: Mr. Camp's was an amendment, as I put it.

Mr. Camp: The effect of my amendment is that the recommendation contained in the last part of the committee's report is adopted by the association. The recommendation was——

The President: Adopted or received?

Mr. Camp: Well, the report has only been received, it has not been adopted. Therefore, the motion of Mr. Bennett is in order now. We simply received the report of the committee and continued it. We have not adopted it. That is in order.

The Secretary: Then the first motion is still in effect with your amendment to it. Then you want to vote on Mr. Bennett's motion as amended by Mr. Camp. He simply adds on to this as I understand it.

Mr. Bennett: Mr. President, may I go into a little further explanation. We have moved and carried the motion that the report of the Special Committee be received and the committee be continued. That was properly I should say an addition, and carried it as an amendment to this motion, in substance that it is the sense of the convention that the new agreement offers an equitable and comprehensive substitute for the old one for immediate negotiation by the railroads as may best be suited to their respective needs and circumstances. Personally I was asking for expressions of opinion from the members as to whether they agreed with that motion or not.

Mr. Griffith: Mr. President, it seems to me that the matter has been quite clearly stated. That amendment has been carried

as an amendment, but it has not been adopted by the house. If we should vote down the original motion as amended, we would vote down the amendment. It seems to me as the gentleman on my left suggests, that really what Mr. Camp offered was a substitute motion and not an amendment. His amendment conflicted with the original motion. But it seems to me it would simplify the discussion if one or the other gentleman would withdraw the motion and the matter come up as a motion, and not as an amendment. By defeating the motion we would defeat the amendment, and I think we all want the amendment to stand.

The Secretary: I would suggest that somebody that voted "aye" ask a reconsideration of the vote on Mr. Camp's motion.

Mr. Camp: As a mover of the amendment I might suggest the following: That the recommendation, or rather that the report of the committee be received, the committee continued, and then follow with Mr. Bennett's motion. How would that suit? It is practically the same thing as putting the original motion.

The President: How about your part of it, Mr. Bennett?

Mr. Bennett: As mover of the original motion I regard the situation to be just this: All Mr. Camp has done is to add to the original motion that the report of the committee be received, and that we receive it. That is the only effect I see, and we now have the original motion as to whether or not this is an equitable and comprehensive substitute, and as to whether or not we recommend immediate negotiations of such railroads as may be best suited to their needs.

The Secretary: I would suggest that, Mr. Camp—

Mr. Camp: The amendment which has been passed simply makes this read that the report of the committee be received, the committee continued, and in view of the report of the special committee it is the sense of this association that the new agreement, the standard telephone operating agreement for railroads

offers an equitable and comprehensive substitute for the old or standard railroad contract for immediate negotiations by the railroads as may be best suited for their respective needs and circumstances. That is the way it stands now.

The President: Is that plain to all the members?

The Secretary: If it is not we will have the stenographer read it over.

The President: Mr. Secretary, will you please read the motion then now as it reads.

The Secretary: That the report of the committee be received and committee continued, and in view of the report of the special committee, it is the sense of this association that the new agreement or standard telephone operating agreement for railroads offers an equitable and comprehensive substitute for the old or standard railroad contract for immediate negotiation by the railroads as may be best suited to their respective needs and circumstances. I think that covers it.

The President: Is there any further discussion, gentlemen?

Calls for question.

The motion being put to a vote is carried.

The President: Gentlemen, with your permission, I want to make an announcement here. We have just received from Mr. Roome, of the Pacific Electric, a message, who states that Mr. Linnard, manager of the Hotel Maryland of Pasadena has requested that on our return trip from Mt. Lowe this evening we stop at the Maryland long enough to partake of refreshments at the Maryland, complimentary to the association members from the Maryland Hotel. If there is no objection I will request Mr. Roome to advise Mr. Linnard that we accept his offer with thanks, and we will arrange to stop there 45 minutes.

The Secretary: Mr. President, I don't know whether Mr.

Bennett has anything more to say on the high tension matter or not. He said he thought he would like to make some remarks.

Mr. Bennett: Mr. President, I move that we suspend the rules for the purpose of receiving the report, the official report, of the high tension wire crossing committee to the association. It being now out of this order of business. In making this motion I wish to explain that this report was delayed a little in the mail and was not here at the time we took up the reports of standing committees. It now being received, this document belongs to the association, it should go into our annual record, we don't want to carry it over another year, and it doesn't in any way affect the discussion which will take place at 7:30 P. M. Thursday in this building.

The motion on being put to a vote was carried.

The President: Mr. Bennett, we will hear the paper read.

Pittsburgh, Pa., June 16, 1910.

Members Committee on High Tension Wire Crossings:

Gentlemen: I enclose herewith, first, copy of minutes of committee meeting held in the La Salle Hotel, Chicago, June 8, 1910; and, second, copy of report forwarded to the annual meeting of the association which convenes in Los Angeles, June 20.

In forwarding these papers I have only this to add, that I believe that as expressed in the meeting and in the report to the association, each and every railroad company in the United States can join us in our scheme as far as the fundamental basis is concerned and, as expressed in these papers, that the detail necessities derivable from these fundamentals, varying as they do with each and every location, make it necessary that the carrying out of such details, as are essential to the local situation of each railroad, shall be left at the option of each individual railroad.

In some situations we find that the typical scheme presented in the blank forms and specifications which have already been printed is regarded as too voluminous; in others, it is not enough in detail. Some of our western railroads believe it unnecessary to go into detail to the extent shown in the plan as heretofore presented, believing that the blanket control and personal supervision will provide a sufficient and more workable plan, while some of the eastern roads, such as the Boston & Maine, New York Central lines, and others—where possibly the personal supervision of the telegraph department representatives is not so intimate as on some of the western lines—require far more details than those expressed in our hitherto presented scheme.

I feel quite certain that our project since its launching has met with such success and done so much good that we have only to put our shoulders to the wheel with renewed energy to carry forward this much-to-be-desired work of bettering crossing conditions throughout the country. Improvement in any locality is reflected in other places, and I very certainly recognize the indications of improvement that show that our work is bearing fruit.

If we continue our efforts with the idea of not only forcing crossings but of securing suitable construction at public service crossings on the plea of "Come with us and we will do you good," and above all by co-operating each with the other in united effort that uniformity, not so much in the details through which our fundamental scheme is carried out, but in the effort to secure adoption of the fundamentals of the plan. I believe the time is ripe for a favorable showing in marked degree during the next twelve months, or before our next annual convention, and further solicit your co-operation in securing interest and help in the matter from yourself and from everybody that you can influence.

Yours very truly,

G. A. CELLAR.

Chairman, Committee on High Tension Wire Crossing.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.

Report, June 9, 1910, of the Committee on High Tension Wire Crossings.

To the Officers and Members of the Association of Railway Telegraph Superintendents.

Gentlemen: Since the acceptance by the association of the agreement and specifications for high tension wire crossings, which were prepared by your committee and presented at the Detroit meeting last year, the regulations conveyed in the agreement and specifications have been adopted for use on a considerable number of railroads throughout the country; have not been taken up by certain railroads which require specifications more in detail; and are under consideration by a large number of other railroads. We feel that gratifying progress has been made in a work which is naturally slow of execution, and it is recommended that the representatives in this association, of railroads that have not yet adopted the association's scheme, shall make further effort in the direction of its adoption.

In this connection, it is desired to reiterate, the reply frequently advanced heretofore in contravention to the statement that the association's scheme will be a bad one to realize, that any safe and stable scheme of construction is difficult of realization under certain conditions, and especially at public service crossings, and that this scheme is certainly no more difficult and probably easier, of securing acceptance by crossing companies than any other that shall be made with due regard to the continued safety of the crossing.

The committee has received numerous criticisms, and has amended the agreement and specifications as shown in the Exhibits attached hereto. There were a large number of other cri-

ticisms and suggestions of change which were not adopted through belief that they should be left to the option of each railroad company, on the basis of proposing for general use all over the country only the fundamental principles on which our scheme of construction is based. The scheme of construction, aside from these fundamentals, as shown in our specifications is typical of but *one* method of working out details, and it is suggested that all these details, including the factors of safety, the methods of approval and execution, etc., shall be left to be worked out according to the individual desires and necessities of each railroad company.

The fundamentals are considered to be:

FOR CONDUCTORS CARRYING OVER 700 VOLTS.

Structures to include three spans each, viz: the crossing span and the abutting spans, on each side of the crossing span.

1. **SUPPORTS:** Self-supporting through guy lines or otherwise. Approved materials, preferably non-combustible. Ground connection on those maintaining crossing span.

CONDUCTORS: Stranded hard drawn copper, or other practically non-corrosive material. Minimum size equal to No. 4 B. & S. G. solid conductor copper. To be dead-ended on each of the four poles by approved strain insulators, and strung with specified sag in each of the three spans; the size of wire adjustable to length of span and factor of safety.

SPAN: Adjustable to size of wire and factor of safety. Maximum preferred, 250 feet.

FOR CONDUCTORS CARRYING LESS THAN 700 VOLTS.

2. **SUPPORTS:** Self-supporting and double armed.

SPANS: Minimum of 125 feet preferred.

WIRE: Minimum No. 9 B. & S. G. hard drawn copper, or No. 8 B. W. & G. galvanized iron preferred.

Length of span, size of wire, etc., to be governed by proper factor of safety.

One of the most important suggestions made to your committee is that some further provision be made for the protection of the wires on and along the railroads that are paralleled by high tension wires, from damage caused by crossing wires coming in contact with both the high tension wires and the wires on the railroad line. This is provided for in the case of overhead crossings of wires carrying less than 700 volts, in the provision for guard wires which it is believed will furnish protection if properly carried out. The better way will be, to have the telephone crossing which is expected may cause trouble, made underground.

The committee has received criticisms as to factors of safety and wind pressure allowance. It is believed by the committee that both are sufficient, especially as regards wind pressure, in the light of some experiments recently made in Scotland which indicated that the extremely high pressures are in surges that affect very small sections of a large body at one time.

Consideration has been given the drop-out span as a means of protection, with the result that its use is recommended to be left optional with the railroads, but if used, it is recommended it shall not be placed in the crossing span, but in one of the abutting spans.

In the matter of formula for the computation of stress and sag, it is felt that the substitution of tables, as indicated in the specifications hereto attached, will present a more workable arrangement than the mathematical formula, and it is recommended that this substitution be made by any of the railroads that desire to do so.

Before concluding, your committee would recall attention to the evolution of the high tension crossing and the forms of construction that have proven inadequate or objectionable:

1st. The cradle hung underneath and parallel with the transmission wires, added to the structure weight and surface for the accumulation of sleet and wind loads. In practice it was found that it did not prevent the transmission wires from falling down when ruptured, as it is a quality of wires under strain to curl up and roll off such a structure when broken. This form of construction has been very largely discarded, and, while an alternate design approved by the national code of underwriters its discontinuance as such is, I am informed, under discussion by that body for removal from the Code.

2nd. Very short span, objectionable through liability to fracture by derailments or swinging car doors overturning the supports.

3rd. Suspension of each wire by carrier wire objectionable through added unnecessary weight and additional surface.

All these schemes, except the short-span arrangement, require the use of materials extraneous to the prime motive of making the crossing and have, in our plan, been discarded for the simpler form of construction which places in the transmission conductors themselves all the strength necessary to be secured in the swinging structure.

It is recommended that renewed effort be made in the direction of the adoption of this simple form of construction, with the extension in detail beyond the fundamentals at the option of each individual railroad, and that the work be pressed with vigor during the coming year.

Respectfully submitted,

Committee on High Tension Wire Crossings.

Mr. Bennett: That concludes the report of the committee, which is respectfully submitted to your consideration. I will say that owing to the arrangement that we made on the first day

of the convention to discuss this matter at 7:30 Thursday evening, it will be going over the ground twice for us to discuss it now.

Mr. Camp: Mr. President, I presume arrangements are made for the stenographer to take down the discussion in the evening.

The President: Yes, Mr. Camp.

The Secretary: Mr. President, I move then, to close up this report, that the report be received, and the committee be continued for another year, the same committee, for further developments.

The President: I would say in that connection, Mr. Secretary and gentlemen, that it is possible that you have not been informed of the request of the chairman of that committee, Mr. George Cellar, to the effect that the committee be increased. His idea was to increase the committee to seven or even nine, in order to have on that committee members from different parts of the country. For example, he wanted one member of the committee to be located west of Denver, another one in the extreme southwest, one in the south, and another in the east. There is no question about the present committee being a very able body to handle this proposition, but at the same time I would personally like to add a few more names to that committee. For your information, the committee now stands Cellar, Groce, Ashald, Cline and Selden. Mr. Groce will have left the service of the railroad and consequently the association as an active member, in fact we have already made him an honorary member. I would like to have that motion read not only—

The Secretary: I will add that, that the committee be increased to nine members, and that five additional names be added. That is, one taking the place of Mr. Groce; that would be five to add.

Mr. Camp: Excuse me, Mr. President, is it necessary to drop Mr. Groce's name from the committee, although only an honorary member. Originally we had some associate members or honorary members; for instance, Mr. Bristol, I think it was, from our associate members. We might get some good, valuable suggestions.

The President: Personally I would very much like to have Mr. Groce continued on that committee, and I should be glad to see that he is on that committee, and I believe that he can be of a great deal of assistance to us.

The Secretary: There isn't anything in our constitution and rules to prohibit it, Mr. President.

The President: Gentlemen, the motion is to the effect that the report of the High Tension Committee be received, that the committee be increased to the number of nine, and be continued over for the next year.

Mr. Camp: I second the motion.

The motion on being put to a vote was carried.

The Secretary: Mr. President, we have a communication here from Mr. H. Wilson—

The President: Just before you commence, I will announce that committee a little later on, as soon as I have time to go over the matter

The Secretary: From Mr. H. Wilson, in regard to wireless telegraphy. We haven't very much time, Mr. President, but if you think you could spare a few moments.

The President: I don't know just exactly what this communication means, but if Mr. Wilson is in the house, we would be glad to have him give us about five minutes on it, and then we could set a date for further discussion if desired by the association. Our time is somewhat limited. Mr. Wilson, is the reason I make that restriction.

Mr. Wilson: I thank you, Mr. President. I will not occupy the five minutes. Dr. de Forest is in the city now. He is, or should be, an authority on the wireless telegraph and telephone business, and I thought it might be of interest to this convention, as also to us, if he could meet and address your convention for a short time, either this afternoon, or tomorrow, or any time at your disposal.

The President: May I ask you on what particular line he desires to address us?

Mr. Wilson: Simply on the line of wireless telegraphy.

The President: I believe that is a matter that should be handled by our Topic Committee, and I would be glad to handle it in that way. In other words, I will refer it to the chairman of our Topic Committee to decide if we can take care of it, and if we can I would be glad to notify you to request Dr. de Forest to be present at any time at which we would be glad to receive it if we can handle it. The Topic Committee will have to go over their work, and should be able to advise you by 1:30.

Mr. Wilson: He will not occupy more than 15 or 20 minutes of the time.

The President: If that is satisfactory, they will give you a direct answer at 1:30.

The Speaker: Shall I come here?

Mr. Bennett: May I suggest, Mr. Sheldon, the chairman of the Topic Committee is present, and only a few feet from the speaker at the present time, if he can answer at this time.

The President: If you can answer at this time, without consulting the committee, I would be glad to have an answer right now.

(Mr. Sheldon confers with the President.)

The President: We will be glad to receive him at 12 o'clock.

Mr. Ghegan: Mr. President, I am probably out of order. That is my normal condition.

The President: Well, we are not drawing lines very closely.

Mr. Ghegan: I have been playing "hooky" this morning, and possibly you have already done what I am going to suggest, but we have all been having a very happy time, and at the opening our secretary waved before us a large number of letters of regret from members who are not able to be with us, and I know of one who I believe this is the first meeting since the organization of the association has been absent, and his regret amounted really to sorrow because he could not come. We all know his affliction, and the further affliction in his family made it utterly impossible for him to come, no matter how much he wished it. I know it to be a fact that he did earnestly desire to come because I saw him the morning I came away. He is a dear friend to all of us, and it occurred to me that a telegram from this association to him expressing its regret, and its greetings and best wishes, would be particularly appreciated. I therefore would move, if it is in order, that the secretary be requested to so telegraph John B. Taltavall.

Mr. Camp: I would suggest that a telegram should also be sent to our esteemed secretary, who has missed, for the first time since he joined the association in 1883, attending its meetings. Mr. P. W. Drew. He came down to the station to see us off, and, as he said, if we expressed any more sympathy with him he would simply start blubbering. So I think we ought to send a telegram to Mr. P. W. Drew as well as Mr. Taltavall.

Mr. President: I see several others attempting to get up and offer the same suggestion about other communications. I think the easiest way to dispose of that is to send telegrams answering all of these communications. I know of several others that really cried over not being able to attend this convention. I think it would be a good idea to have a committee to write them up.

Mr. Camp: I would suggest that telegrams be sent to only those who have been in frequent attendance at the meetings, **Mr. President.** There are a large number who wanted to come any way. There are Chenery, Ryder, Taltavall, Drew, Selden—

The President: I consider a committee is the best way to handle the matter. I will appoint a committee of **Mr. Camp, Mr. Ghegan** and **Mr. Sheldon,** to telegraph to **Messrs. Drew** and others in regard to their absence.

The Secretary: I would like to suggest that the committee be made a committee on resolutions, and also extend thanks to all the——

The President: There is one committee on resolutions here. What is your objection to handling that at the same time we take care of these other resolutions. Have you any objection to that, **Mr. Camp** and **Mr. Ghegan?** **Mr. Ghegan** is a member of the Committee on Resolutions and I have no doubt will be very able to take care of all of this. If there is no objection I will request the assistance of **Mr. Camp.**

Mr. Camp: It is large enough.

The President: There is only one man on it.

Mr. Camp: If there is only one man I would suggest adding **Mr. Griffith** and **Mr. Sheldon.**

The President: All right, I will appoint **Mr. Griffith, Mr. Sheldon** and **Mr. Ghegan.**

The Secretary: **Mr. Griffith** suggests that you let that committee stand to send those telegrams and then appoint another committee.

The President: A special committee to take care of that particular business?

Mr. Griffith: Yes.

The President: All right, that is right. When Mr. Camp corrects me I expect to wilt. I will name the committee appointed in the first place, Mr. Ghegan, Mr. Camp and Mr. Sheldon.

The Secretary: Now, Mr. President, I move that you appoint a committee on resolutions to give thanks to the telegraph and telephone companies and all others—and also the entertainment committee.

The President: It is not necessary to make a motion to that effect. I will appoint as Committee on Resolutions Messrs. Griffith, Williams and Walker.

The Secretary: Now, Mr. President, there should be an Auditing Committee of two appointed so that they can audit the treasurer's and secretary's report.

The President: For the Auditing Committee I will name Mr. B. F. Frobes and Mr. E. W. Mason.

Mr. Sheldon: Mr. President, I introduce to you, Dr. de Forest.

The President: Gentlemen, let me have your attention, please. Dr. de Forest, who will give us an address on wireless telegraphy.

A PAPER READ BEFORE THE ANNUAL CONVENTION OF RAILROAD TELEGRAPH SUPERINTEND- ENTS, AT LOS ANGELES, CAL., JUNE 22, 1910.

WIRELESS COMMUNICATION AS APPLIED TO RAILROAD LINES.

A subject of this type must necessarily deal largely in futures, yet the demonstrated possibilities of the Radio telegraph and telephone and the strict requirements of the railway service are today so well known by the experts in each separate field, that by conferring and co-operatively working together, it is reason-

able to suppose something tangible, and of real value to both may rapidly result.

The possibility of telegraphing wirelessly to moving trains over considerable distances by means of the old fashioned spark telegraph, was I believe, first demonstrated in 1905, over the Chicago & Alton Railroad out of Chicago and St. Louis.

Thanks to the enlightened interest which the officials of that road took in my proposals, I was allowed the privilege of experimenting on the fast daylight express between St. Louis and Chicago. Two horizontal antenna wires were first run on insulators along the top of the train and connected to a receiving instrument installed in the parlor compartment of that coach. Earth connection was made to the trucks, the 15 KW Station at East St. Louis about two miles from the trackside and the 10 KW Station at Chicago, a quarter mile from the rails, were used as transmitters. No attempt was made at that time to transmit messages from the train. But unfavorably situated as both these stations were, so far from the tracks, messages were clearly received on the flying train when 30 to 35 miles from these stations.

Subsequent experiments at New Haven and Toronto, Canada, demonstrated the correctness of my view, that the track rail system, including the mass of telegraph and telephone wires along the right-of-way serve not only as a conducting zone or wave chute along which the electric waves preferred to travel; but also acted as a net to catch waves coming transversely or obliquely toward the right of way, and then distributing in both directions along the track a surprisingly large amount of electric energy.

On account of this directive action of the telegraph wires, it is easy to pick up strong wireless telegraph signals by a wave detector connected to a short horizontal wire stretched parallel and near to the telegraph wires, and at a surprisingly large distance from the wireless transmitting station.

Now given this phenomenon, it is easy to understand how a trackside wireless station, using a horizontal antenna wire, say 100 feet long fastened to two or three telegraph poles, can communicate with another trackside station similarly arranged, and distant twenty or even more miles from the first.

Obviously one or both of these stations can be located on board a train and in such case the horizontal antenna wire can, as I have demonstrated, be run inside the cars, of heavily insulated wire, parallel to the bell cord. This is of course providing that the cars are wood and not of steel. In the latter case, wires would need be supported on insulators a few inches above or at one side of the roof of the cars.

By the above described arrangement it would be a comparatively simple matter to telegraph regularly to and from express trains, over a distance of say 40 miles (20 miles on each side of the trackside station.) However, the commercial application of such a wireless telegraph service would be generally limited to a few crack limited trains, where for the benefit of traveling business men, a news or stock reports service could be made a feature. The expense of carrying a telegraph operator on board, more than the cost of equipment entailed would greatly limit such application.

With the Radio (or wireless) telephone, however, the case becomes very different, so different in fact that it is my firm belief that ere many years, the telephoning to moving trains, especially to locomotives will become a very common or well nigh universal addition to our elaborate railroad safety appliances.

For such a purpose long distances of communication will be quite unnecessary, in fact undesirable. Consider a railroad system equipped with the block system, with signal stations or towers at mile intervals; a small wireless telephone transmitter capable of half-mile communication, and utilizing the inductive or "wave chute" action of the existing telegraph wires, would cost

little to install, little to operate and be so simple as to add practically nothing to the training of the signal operator. A horizontal antenna wire would be extended to the first or second telegraph pole, stretched three feet below the lowest telegraph wire, the earth connection would be made direct to the track rails. On the locomotive or over the locomotive and the first coach, will extend an insulated wire as easily coupled up when making up the trains as is the air break at present. In the cab a small box is fastened containing a tuning coil and a simple crystal wave detector; connected to this is a single-head telephone receiver with headband attached, or a telephone receiver with rubber ear pad is fastened to a short arm, at a point where the engineer can easily rest his ear against it. The body of the locomotive of course, supplies the earth connection.

This system would enable the signal man to talk direct to the engineer for a period of one to four minutes, and add immensely to the probability that he will receive the proper signal, or enable him to receive orders or information which the semaphore cannot possibly communicate. No engineer could, of course, reply except to O. K. by whistle.

It would appear that by this appliance it will be generally quite unnecessary for a train to stop merely to receive dispatcher's orders. What value this saving in time of hundreds of trains would aggregate to the railroads in a year, I have no means of estimating. Surely it would total very large figures.

Arrangements have already been made with the New York Central for carrying out a series of experiments in telephoning thus to moving trains, from a trackside station at Spuyten Duyvil on the Hudson; and I expect to be able to publish some very interesting results within a short time.

A short-range wireless telephone transmitter for such service as I have just described is operated from a few cells of Edison-

Leland battery, and the entire transmitting outfit will occupy less than three cubic feet of space.

Now consider the application of such wireless telephone instrument to freight train service, on roads like the Santa Fe, for example, without block system stations at short intervals.

It frequently happens that a train awaits on a siding for long periods the passing of another which has been delayed by accident or other cause, and with no means whereby the train crew can be notified to proceed. A portable wireless telephone set installed in the caboose could be quickly brought into action to call up the nearest dispatch station.

To facilitate this work a length of flexible antenna wire can be very quickly spiked up on two or three telegraph poles as high as a man can reach, parallel to the telegraph wires or directly connected to a wire through a small condenser, the capacity of which is too small to allow any detrimental grounding of the wires. This "emergency antenna" can be strung up and taken down again in two minutes. Such means for getting quick communication to stalled freights will mean an immense saving in costly delays to freight and to all trains affected by the tie up, to say nothing of loss in wages to idle train crews, this latter item especially where the 16 hour law is operative.

I believe that the railroads will soon see this method demonstrated, and be quick to admit the economy to them of equipping every caboose or a car on every accommodation train with such portable wireless telephone transmitting and receiving sets, for emergency use, whether or not the locomotive carry the receiving apparatus, which I have already described.

NOW A WORD AS TO LONG DISTANCE WIRELESS TELEGRAPH FOR R. R. DISPATCHING.

Ideas as to the possibilities of our land, wireless telegraph for commercial purposes have been generally founded on the all too plainly demonstrated failures and shortcomings of the spark

system. Such a service is limited to a relative short distance over land by daylight, on account of the sad inefficiency of the spark wireless transmitter. The best of the spark systems can radiate generally less than 10 or 12 per cent of the energy taken from the dynamo. Then too, the trains of electric waves which the spark transmitter sends out are "strongly damped" as we say—i. e., rapidly tail down to zero. Sharp tuning at the receiving station to cut out interferences from other stations or from atmospheric causes is quite impossible when one has to work with these strongly damped waves from a spark transmitter.

Hence, in addition to the short ranges necessitated, the spark system is not and cannot be made reliable and "interference proof." Such means therefore as supplementing the wire service of a railroad at times of emergency, as when long stretches of wire are mowed down by sleet and wind storms is quite impracticable because so altogether unreliable.

During the last year, however, a new epoch in wireless telegraph has been entered, marked by the Radio Telephone Company's new sparkless wireless telegraph system. This "Radio tone" transmitter (as it is called) is sparkless and noiseless. In place of the noisy, crude and inefficient spark-gap, it employs a silent discharge and radiates from the antenna wires trains of waves which are very little damped, i. e., which tail down to zero very slowly.

Moreover we can now radiate 50 to 75 per cent of the energy derived from the alternating current dynamo, instead of the 10 to 12 per cent of the spark system. This means that ranges two to four times greater than those given by the old spark method are possible, and that wireless interference from natural or artificial sources can be completely and successfully eliminated.

As proof of my statements note the work daily carried on between our New York and Philadelphia and Washington stations where in each case a spark station of another wireless company is

operating within one to nine city blocks from our own, yet an hourly commercial wireless service is continually maintained by our company.

I have here a photograph taken last week in San Francisco, of a two Kilowatt installation of the sparkless Radio tone system on board the U. S. Army transport Buford. The first day this apparatus was put in operation the Buford lying at her wharf in San Francisco communicated in bright daylight with a naval station at Point Aguillos, nearly 300 miles south, a new daylight record on this coast.

A number of other army transports are now being equipped with this system, replacing the spark apparatus.

The art has now actually reached the stage where we can begin to handle overland business in competition with wire lines.

Therefore the sparkless, wireless telegraph possesses immediate interest to railroad telegraphers as ready means for communicating over long distances between division headquarters, especially at times of emergency when storms and washouts have cut wide gaps in the wire system.

I foresee this use of the wireless telegraph coupled with short-range telephone safety signalling and emergency service as occupying a very extensive field of usefulness to railroads and the traveling public.

DR. LEE DE FOREST.

In the discussion of the paper Mr. Camp inquired whether it would be possible for two passenger trains traveling in opposite directions to carry on telephone communication over distances of say two miles. Dr. de Forest replied that it would, and that if limited passenger trains were equipped with a dynamo in place of batteries a much longer distance would be possible.

The President: Mr. Dyer inquired what experiments had been already carried on in telegraphing to moving trains. The first

experiments with the wireless telegraph were made on the Chicago & Alton in 1905. Last year the Fred Thompson Theatrical Special "Via Wireless" train from New York to Chicago was equipped with a telegraph transmitter, and several trackside wireless stations installed, for the purpose of keeping in touch with this train throughout its journey. These tests, I understand, were very successful.

In reply to inquiries as to how the proposed wireless service would affect the existing telephone and telegraph instruments, Dr. de Forest said it would be possible to hear in the telephone receiver the wireless signals of the telegraph and possibly the telephone, but only faintly and not to interfere at all with the present service. The wireless waves acted strongly only on special detectors, like the crystal silicon, the "Audion" and the like. If necessary choke coils, without iron cores, can be inserted in the telephone wires outside of the stations to effectually prevent the electric waves from entering the wire telephones and telegraph instruments. The wireless signals can be then taken off from the lines through very small condensers into the wireless instruments intended for their reception.

Dr. de Forest: I should be very glad indeed to answer any questions on this subject that any of you might like to offer. I know this is a pretty new subject to most of you, but it is a subject that you will probably have to handle in the near future.

Mr. Bennett: Well, Dr. de Forest, do I understand that in the near future a railway company may operate a wireless telegraph office on a moving train, a high-class passenger train?

Dr. de Forest: Yes, sir. Yes, I think that we are willing to undertake a contract from any railroad to do that and guarantee them sufficient communication, to be conservative say twenty miles from the train on each side, that will make it forty miles from the trackside station, and will give you practically an hour's communication there. If the stations are scattered along the track

from forty to fifty miles, the train would be in telegraphic communication at all times. But with the telephone, as I say, we would not undertake any such distance at the present, and as a matter of fact, for safety such communication would not be desirable; one mile, or a half mile on each side the station would be all that was necessary to communicate with the locomotive engineer.

Mr. Camp: Will you inform us as to whether by the method that you propose one train could be in communication with another train at a distance not exceeding two miles by telephone?

Mr. de Forest: Yes, sir, by telephone if the wire could be run over several cars. In of course telephoning from the track-side station to a locomotive unless you want to go to the trouble of running the wire back to the back coach, the distance would be very short, perhaps fifty feet at the most. Now, if you had two passenger trains, each equipped with wireless 'phone and the wire going from one end of the train to the other, two hundred feet, so that wire could be coupled up of course just as quickly as you could couple the air brake, with that arrangement it would be possible to telephone from one train to the other over a distance of two miles at least, and I am willing to say where we go into some expense and put in a more powerful installation, and for our long distance wireless telephone we use a dynamo, but for this short distance work we use the batteries—this battery I speak of is only for short distance work; the farthest we have ever worked that is one mile, while with a dynamo we worked from Milwaukee to Chicago, with the dynamo wireless set. That was of course where we had a very high mast at each station.

It seems one of the kindnesses of nature the fact that the wires stretched along the railroad track do act as a net to collect these electric waves, and as the waves shoot out carry them along. You can imagine a big zone of influence perhaps thirty

feet and parallel on each side of the track; the wires are in that zone of influence. Were it not for that this whole proposition would have nothing in it of course.

A Voice: How is that going to affect our telephone wire service?

Dr. de Forest: It wouldn't affect it to any extent. You may be able to hear something on there, but it will be faint. We have found that true with powerful telegraph stations, telephone wires running right into them. You pick up a little noise. You can possibly read the messages they are sending out, but it doesn't interfere with your conversation. It will be with the telephone very much as it occurs now sometimes by cross talk, barely know some one is talking, but you can't read it because the existing telephone instruments are not responsive to these electric waves.

Mr. Camp: Dr. de Forest, would not the frequent transposition of telephone lines eliminate anything from the wireless system?

Dr. de Forest: To a very large extent, but not altogether.

The President: Dr. de Forest, I am not prepared to discuss this new proposition. I would thank you very much for the paper. And to me personally it has been a great deal of information. Recently for some three weeks we were practically out of telegraphic communication along the line of our railroad, owing to extensive washouts. I often thought if we had a portable wireless telegraph or telephone station it would be of great advantage to us. And I hope that some railroad may establish a plant which will give us all an opportunity to view the practical working out of it. Do I understand you have it on any railroad as yet?

Dr. de Forest: Not the telephone, sir; the telegraph we did work on the Chicago & Alton in 1905, and then made an experiment last year. I think it was the Thompson show, theatrical

company, called "Via Wireless," came through from New York to Chicago. We had a special train, and just as an advertisement he put on the wireless telegraph set on that train and had two or three trackside stations arranged for, and was able to communicate from the train to the track over a good share of the distance from New York to Chicago. But these two occasions are the only ones so far as I know where it has been done. I understand the Union Pacific is going into the matter quite seriously and has been for a year or two maintaining laboratories, handled by Professor Milburn. Perhaps a representative here can tell us more about that.

Mr. Sheldon: Dr. Milburn of the Union Pacific has been experimenting for probably two years on wireless telephony. As I understand, there is nothing accomplished that could be reported for the present.

The President: I thank you very much for this paper and talk, Dr. de Forest.

The Secretary: There is no more business now, I believe.

The President: Dr. de Forest, we are going to Mount Lowe this afternoon at 2:30; if you have the time we would be glad to have you go with us.

Dr. de Forest: I should be very glad indeed to accept that invitation, Mr. President.

The President: I will announce at this time—you perhaps all understand about it—tomorrow we make the trip over the Kite Shaped tracks of the Santa Fe railroad.

The Secretary: I move we adjourn until 9 o'clock Friday morning.

Which motion, after having been seconded, was carried.

SPECIAL MEETING OF ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.

Alexandria Hotel, Los Angeles, Cal.

June 23, 1910, 7:30 P. M.

The meeting was called to order by the acting President of the association, Mr. I. T. Dyer, Superintendent of Telegraph, San Pedro, Los Angeles & Salt Lake Railroad, Los Angeles, California.

The President: Gentlemen, yesterday the Association of Railway Telegraph Superintendents received, accepted and filed a report from the Committee on High Tension Wire Crossings of the association. Pursuant to a call, this special meeting is held tonight for the purpose of hearing Mr. Bennett read the papers concerning this report. The idea is to have a free discussion, and I hope that you will all participate in the same. In order to facilitate the handling of the paper at this particular meeting I would like to ask Mr. Bennett to occupy the chair—Gentlemen, Mr. Bennett, Superintendent of Telegraph of the Chicago & Northwestern Railway, Chicago. The chairman of this committee was prevented from presenting the paper, and Mr. Bennett has only taken up the work the last two weeks, consequently he is not quite as well prepared to present it as would be the chairman, Mr. George A. Cellar.

Mr. Bennett: Gentlemen, perhaps the first thing in order will be an explanation of the action of the Association of Railway Telegraph Superintendents concerning the matter of high tension wire crossings. This committee has been called the Committee on High Tension Wire Crossings, but it has formulated and presented specifications for low tension crossings also.

The wire crossing question involves a great many interests of many kinds, and there are many angles from which a view of the matter may be taken. We have found that the companies transmitting high tension currents for power, particularly, usu-

ally are well convinced that it is to their interests as well as that of the railways and the public in general, that the engineering should be first class, and that the materials used and the methods of construction should be of the best. It would mean losses to them to have failure. In many cases they are subject to serious forfeits and liable for penalty payments if there is an interruption in the service, and they seek to guard against such things by good construction.

Between that high class work and the ordinary telephone and telegraph and similar work, there is a wide range of intermediate classes, which was the reason for the association dividing at 700 volts over or under.

Specifications have been made covering materials to be used and the preferred methods of construction in cases of wires unprotected and conductors crossing overhead, when they carry 700 volts or over, and all similar crossings carrying less than 700 volts. These two classes are again provided for in case of cable overhead crossings, and yet again in cases where the wires may be carried under the tracks or underground. The principal thing has been to secure protection against casualties, injuries, or fatalities involving persons, and secondly, of course, damage and loss of property.

Then there comes in the question of protecting the railroad company's title to its right of way against an easement acquired by prescription. Most of you are no doubt familiar with the legal view of what constitutes a trespass, but I might say, briefly, that if you own a piece of ground, and it is square on the surface of the ground, it is bounded by four lines that meet in an infinitesimal point in the center of the earth, and if you will project those four lines from that infinitesimal point in the center of the earth and intersect the four corners of your square, and then carry them upward into the heavens, you own everything above the surface, and if anybody stretches a

wire across in the air, legally he trespasses on your rights as a landowner. Of course, that is carrying it pretty far, but that is the fundamental law of land ownership.

And it is an object, of course, of railways, when they grant a license, to have their right of way crossed where they own, to give a license which will prevent an easement being acquired by prescription from long use, uncontested, and so they are enabled, if occasion should arise, to require the obstruction to be removed, or they may want to use their property, not only on the surface, but under and above both, for railway purposes. All of these things are involved from the railway point of view in this question, so that one of the things that becomes necessary in a license, as our committee has prepared it in a typical form, is the license of the landowner, that is, the railway, to the telephone or electric light or transmission company to occupy or use, or to suspend or have their conductors suspended over the railway company's right of way or land.

There is also, of course, involved the question of injury to employes from lack of proper clearance, of fires and other forms of destruction of property from actual contact or inductive influences, all of which the committee has attempted to take care of, and at the same time, in taking care of these varied interests, has tried to draw specifications and a license which would allow a great deal of latitude in individual cases. For these reasons our specifications and our license are largely typical. It is an outline of what would be considered an ideal condition, if it could be attained.

The committee of the association recognizes the fact that it cannot be attained in all cases. The committee certainly felt that it was commissioned to lay down the ultimate thing in engineering, either electrical or civil, in this matter, and a careful examination of the documents, which I assume more or less of you have made, will indicate that provision is made for variations.

Now, I would like to quote a few words from the report of the committee in connection with that matter:

The committee has received numerous criticisms, and has amended the agreement and specifications as shown in the Exhibits attached hereto. There were a large number of other criticisms and suggestions of change which were not adopted through belief that they should be left to the option of each railroad company, on the basis of proposing for general use all over the country only the fundamental principles on which our scheme of construction is based. The scheme of construction, aside from these fundamentals, as shown in our specifications is typical of but *one* method of working out details, and it is suggested that all these details, including the factors of safety, the methods of approval and execution, etc., shall be left to be worked out according to the individual desires and necessities of each railroad company.

The fundamentals are considered to be:

For Conductors Carrying over 700 Volts. Structures to include three spans each, viz: the crossing span and the abutting spans, on each side of the crossing span.

1. *Supports:* Self-supporting through guy lines or otherwise. Approved materials, preferably non-combustible. Ground connection on those maintaining crossing span.

Conductors: Stranded hard drawn copper, or other practically non-corrosive material. Minimum size equal to No. 4 B. & S. G. solid conductor copper. To be dead-ended on each of the four poles by approved strain insulators, and strung with specified sag in each of the three spans; the size of wire adjustable to length of span and factor of safety.

Span: Adjustable to size of wire and factor of safety. Maximum preferred, 250 feet.

For Conductors Carrying Less than 700 Volts:

2. *Supports:* Self-supporting and double armed.

Spans: Minimum of 125 feet preferred.

Wires Minimum No. 9 B. & S. G. hard drawn copper, or No. 8 B. W. & G. galvanized iron preferred.

Length of span, size of wire, etc., to be governed by proper factor of safety.

One of the most important suggestions made to your committee is that some further provision be made for the protection of the wires on and along the railroads that are paralleled by high tension wires, from damage caused by crossing wires coming in contact with both the high tension wires and the wires on the railroad line. This is provided for in the case of overhead crossings of wires carrying less than 700 volts, in the provision for guard wires which it is believed will furnish protection if properly carried out. The better way will be to have the telephone crossing which is expected may cause trouble, made underground.

The committee has received criticisms as to factors of safety and wind pressure allowance. It is believed by the committee that both are sufficient, especially as regards wind pressure, in the light of some experiments recently made in Scotland which indicate that the extremely high pressures are in surges that affect very small sections of a large body at one time.

Consideration has been given the drop-out span as a means of protection, with the result that its use is recommended to be left optional with the railroads, but if used, it is recommended it shall not be placed in the crossing span but in one of the abutting spans.

In the matter of formula for the computation of stress and sag, it is felt that the substitution of tables, as indicated in the specifications hereto attached, will present a more workable

arrangement than the mathematical formula, and it is recommended that this substitution be made by any of the railroads that desire to do so,

Before concluding, your committee would recall attention to the evolution of the high tension crossing and the forms of construction that have proven inadequate or objectionable:

1st. The cradle hung underneath and parallel with the transmission wires, added to the structure weight and surface for the accumulation of sleet and wind loads. In practice it was found that it did not prevent the transmission wires from falling down when ruptured, as it is a quality of wires under strain to curl up and roll off such a structure when broken. This form of construction has been very largely discarded, and, while an alternate design approved by the national code of underwriters, its discontinuance as such is, I am informed, under discussion by that body for removal from the code.

2d. Very short span, objectionable through liability to fracture by derailments or swinging car doors overturning the supports.

3d. Suspension of each wire by carrier wire objectionable through added unnecessary weight and additional surface.

All these schemes, except the short span arrangement, require the use of materials extraneous to the prime motive of making the crossing and have, in our plan, been discarded for the simpler form of construction which places in the transmission conductors themselves all the strength necessary to be secured in the swinging structure.

It is recommended that renewed effort be made in the direction of the adoption of this simple form of construction, with the extension in detail beyond the fundamentals at the option of each individual railroad, and that the work be pressed with vigor during the coming year."

The chairman there has endeavored to give you his idea of the feasibility of these requirements. He speaks of some modifications in the note that the exhibit which he has sent contains, some modifications of the original agreement or license, particularly, for instance, where in the original agreement the document stated that "the licensee is desirous of constructing and maintaining *wires* for the conduct of electric current across the right-of-way," etc., it has been amended to read, "constructing and maintaining *conductors* of electric current across the right-of-way." The word "conductors," in fact, has been substituted all the way through the license for the word "wires," with the necessary changes in phraseology to make it harmonize.

Again, in the fifth article of the agreement, that concerning immunity to the railway company, which formerly read, "Claims or demands therefor, on account of injury to person or property, which may be incurred by the railroad company by reason of the license herein given," has been changed so that it reads: "By reason of and connected with the exercise of the license herein given."

In article sixth, that portion previously reading, "When and as often as said railroad company shall desire to have the location of said poles and wires changed," has been made to read: "Location of said poles and conductors of said licensee changed."

In article nine, the termination clause, stating how the license may be terminated by the railroad company giving notice, and that at the expiration of the time mentioned in the notice "all privileges of the licensee hereunder shall at once wholly cease and determine," has been made to read: "Wholly cease and be at an end."

In the acceptance of the license by the licensee, it now reads: "The said licensee, for itself, its successors and assigns, hereby accepts the license herein given, upon the above specified terms and conditions." The original document did not read that way:

instead it was as follows: "The said licensee hereby accepts the license herein given," without including, "for itself, its successors and assigns."

I think, now I have stated in a general way the position of the railways in this matter and of the Railway Telegraph Superintendents' Association, and those who desire to discuss the committee's license and specifications, or to ask questions, should now have the floor for that purpose.

I will ask Mr. Elam Miller, transmission engineer of the Pacific Telephone and Telegraph Company of San Francisco, to give us his views in regard to these matters from the telephone companies' standpoint. Gentlemen, Mr. Miller.

Mr. Miller: I think, in so far as the matter of wires crossing railway rights-of-way are concerned, Mr. Bennett has very clearly explained the purpose of the specifications which form the subject of this meeting, and I doubt if I can add anything of interest.

The situation, from the standpoint of the telephone company, is quite different. Telephone lines are not in general constructed on railroad rights-of-way, and it is therefore not possible for a telephone company to take the decided stand that may be taken by the railroad company.

Telephone companies are at present interested in the problem of high potential protection by mechanical means, in that it has been demonstrated quite clearly that electrical protection for potentials in excess of 5,000 volts is not feasible. Some few years ago it was the general practice to consider mechanical protection by means of grounded or insulated screens. Experience has indicated that both of these means are open to serious objection, and the best present practice specifies so constructing the high tension cross-over span and adjacent spans in such manner that the possibility of failure is reduced to a minimum.

I have here a set of notes which give in specification form the chief considerations to be observed in constructing high tension lines over telephone circuits.

These specifications apply to constant-potential power transmission lines of over 5,000 volts.

These specifications prescribe a certain minimum standard of construction for the high tension line which is required in order to provide a reasonable degree of security against the failure of any portion of the high tension construction that might allow the high tension wires to come into contact with the telephone wires.

It is not the purpose of these specifications to restrict the high tension construction narrowly in details, but to stipulate the fundamental principles which must be followed in order to attain reasonable safety.

Each portion of the high tension line shall have sufficient strength to resist the maximum mechanical stresses to which it may be subjected, due allowance being made for a factor of safety suited to the degree of uniformity of the material, the character of the material with respect to deterioration and the nature of the stress, as hereinafter specified.

Obviously the maximum mechanical loads upon the high tension construction will usually occur when the wires are coated with ice and subjected to the maximum wind velocity at right angles to the line at the minimum temperature.

The maximum stresses in the high tension construction shall be computed on the basis of a wind pressure of 20 pounds per square foot of plane area, or 12 pounds per square foot of projected area for cylindrical surfaces. These values are based upon a maximum actual wind velocity of seventy (70) miles per

hour and are to be used in connection with the following coincident conditions:

- (1) Maximum coating of ice, $\frac{1}{2}$ inch in thickness.
- (2) *Minimum temperature, zero degrees Fahrenheit.

The general types of construction which shall be employed, the factors of safety to be observed, and the minimum sizes and strengths of materials, shall be as specified below:

Where galvanizing of iron or steel is required it shall conform to the requirements of the appended specifications for galvanizing for iron or steel.

I shall not continue the reading of these specifications, but will simply state that, in a general way, the considerations which will result in reducing to a minimum the possibility of contact between the high tension lines and the telephone wires are clearly outlined. The methods of construction suggested are those that it is felt will in general receive the sanction of power engineers, and it is our hope the matter may be so presented to the power companies that present hazardous conditions will tend to be reduced.

I am not entirely familiar with the system of electrical protection specified by the telegraph companies, but upon reading the specifications prepared by the Association of Railway Telegraph Superintendents I was impressed by the fact that mechanical protection against voltages as low as 700 had been considered. As a result of Mr. Bennett's explanation I can see that it is by no means a case of hazard introduced entirely by the potential of the lines crossing the railway right-of-way, and any

***Note:** In a few sections in southern portions of the country minimum temperatures of zero degrees and ice formation are not encountered. For transmission lines constructed in such regions the above requirements may be suitably modified to accord with the local climatic conditions. In no case shall the minimum temperature be taken above thirty (30) degrees Fahrenheit.

comments that I had previously intended making would not be in order. I should, however, be inclined to think that some difficulty would be experienced on the part of railway companies in an attempt to secure the sanction of high tension companies to consider crossings by either underground or aerial cables, as has been suggested.

Mr. Bennett: We have endeavored to meet conditions as we found them in these specifications, and we recognize the fact that it is generally the opinion that high voltages cannot be well protected with underground crossings. I have noted a variety of opinions as to the voltages that might economically and safely be handled in that manner. Now, the specifications of the committee are simply 700 volts or over. If there is any voltage over 700 volts which cannot be satisfactorily handled underground, then the specifications provide a method for taking care of that particular case. If it is felt that it cannot be done successfully on account of the high voltage in those particular instances, then we expect to take care of the matter overhead. The committee did not intend that the underground crossings must be complied with irrespective of the voltage. I don't know whether that is Mr. Miller's understanding or not, but we wish to have it understood that that was not our intention. The underground, if it is a desirable construction in a given place, and the conditions are such that it can be applied, is the way that we would like to have it done, and the same thing is true with the overhead construction. I think I need not say any more about that. If, in a given case, the crossing company desires to use a cable, we have prescribed a method that we would like to have followed, and we would like to get together with that fellow and see if we cannot persuade him to do it the way we would like to have it done.

Mr. Dyer has very kindly handed me the names of the gentlemen interested in this question, and I will ask Mr. Scattergood if he has examined the situation from the telephone com-

pany's point of view and has any criticism to make. That is what we want. We want to get your ideas and your opinions. If we have done anything wrong we want to know it; we want to know wherein we have failed, if we have in any particulars. Gentlemen, Mr. Ezra F. Scattergood, electrical engineer, Los Angeles Aqueduct.

Mr. Scattergood: Mr. Chairman and Gentlemen of the Association: I understood our chairman was going to make a statement for us. We talked it over together a little, and I have looked over the specifications some, but not to the extent, perhaps, that I should, in order to discuss the specifications in detail. I read over the form of agreement pretty carefully before looking at the specifications at all, and there is one suggestion that occurred to me in reading that over, which is, that the inference seemed to be that the railway company was, in every instance of this kind, on the ground and owned the ground, and that no provision was made, apparently, for the cases in which the carrying company had its lines there, and the railway company desired to pass under it.

I have had some of that same experience myself, in finding the railway companies inclined to feel that they were there first, whether they were or not, and these specifications and agreement appear to imply that same feeling that my experience has shown. I would like to suggest that it would help us to get together a great deal, by looking at it from the standpoint of the power company and the railway together—both being necessary to our civilization in the form in which it exists at the present time, both being necessities, in other words, and where the railway company and the power company conflict, that is, to the extent of desiring to cross one another, is it right to assume that in every instance the power company should stand all the expense, when it is the existence of the railway company there that makes that extra expense necessary. And, of course, if the railway company was not there, there would not be any

question at all. It does seem to me that it is doubtful as to whether it should be assumed that the power company should stand all this expense in every instance, or that the power company is the one who is trespassing, so to speak, in every instance. Are they not both necessities? And shouldn't the railway company and the power company bear the expense jointly, as a general proposition?

Now, the specifications and the form of agreement seem to me to be based on the supposition, as I have already stated, that the railway company was there first, and I do not think, if we are getting together in a broad-minded way, that that assumption should be made, or that assumption of being in there first should enter into it at all, because the railway company is not necessarily there first, and if it is there first, still the power company, I think, should be regarded as a necessity. We ought to get together. it seems to me, on a form of agreement as well as in the matter of the details of the specifications, from the technical standpoint, looking at it from that view, that they are both necessities, and regardless of which is there first—sometimes one and then the other. Of course, there might be a difference of opinion about that point, but certainly it is not right, and you can't expect the power companies to have just the broad view that you appear to assume them to have of this matter, as reported by your committee, when you appear to assume that the railway has all the rights, and is always there first, and the power companies therefore should stand all the expense, when the existence of the railway companies there makes that expense necessary. And there is no distinction between crossings where it is a public highway and public crossing, and a private crossing, so to speak, where there is no public crossing whatever, simply the two rights-of-way conflict.

Now, I will agree with you that there should not be any distinction, if you will agree with me in what I have already said, that it is a case of crossings and of companies of two sorts,

both of which are necessities, and whether it is one place or another, it seems to me that the same rules should apply as to technical points of engineering and the same general form of agreement should apply, although there may be exceptions on that point. It should not be looked at from the point of view of anybody getting there first in regard to public crossings or private crossings, but simply two necessities, getting together on an even footing; then if it can be shown that either company had prior rights, or paramount rights, why, that might be done after we had gotten together on a general form of agreement, and that be the exception, and not start out with the exception and expect us power companies to regard it as a fundamental form of agreement.

Very much the same exceptions as noted to these specifications might be applied to the form of contract or agreement, but with somewhat additional, and not altogether repeating the idea.

In paragraph three of the agreement proposed, it is provided that "the licensee will, on written request of the railroad company, at any time promptly repair said conductors," etc., and if he does not promptly repair, the railway company shall have the right to remove his line. Well, now, that certainly seems to go on the assumption that the railway company is the only one of the two parties that has any soul as to the matter of protection of life. I don't think that is necessarily true, in the first place, and, in the second place, that whole paragraph seems to me superfluous, because paragraph two requires that this work be constructed and maintained in accordance with those specifications, that is, maintained in accordance with the specifications which the railway company and the power company have agreed to. Is there anything more necessary? Why should the railway company want to add that the repairs shall be made in accordance with the method prescribed by the railway company, regardless of the original specifications? At any rate, it makes no reference to it, but provides that if it is not

done by the licensee it may be done by the railway company at the expense of the licensee, or the railway company shall have the option of taking down and wholly removing said conductors. There might be a reason why the railway company would prefer to take them down, because some railway companies are interested in power transmission, and there might be some reason for wishing to remove the conductors, and you cannot expect the power companies to sign away their rights in that way and place their business at the arbitrary disposal or action of a railway company.

Aside from the fact that it seems unnecessary, on account of the other paragraph which it duplicates in the way already referred to, and the manner of maintenance being already required in the specifications, the other idea which it contains is covered by that paragraph with regard to immunity from any damage—that the licensee will indemnify and save harmless the railroad company, etc. According to that, it is the power companies' loss if they are careless about that repair work, and not the railway company's. Why should you put that in there, and if you do put it in there, why should you assume, and ask the power company to put themselves into your hands entirely, and especially why, when it is in a way where you could be unreasonable if you wanted to about what the repairs ought to be, and the power company would have to live up to it or have its line taken down?

And in regard to signing an agreement of this character, while a company cannot sign away its legal rights, as I understand it, yet a legal agreement of that sort would substantially prevent its getting an injunction to prevent its power line from being taken down by a railway company, in a dispute between two officers, and it could put it entirely out of business. You know what that would mean to a power company, the same as to a railway company, to stop their traffic all at once.

I can't see how you can expect the power company to agree with you and be broad-minded enough to agree to that.

In paragraph six the following occurs: "When and as often as said railroad company shall desire to have the location of said poles and conductors of said licensee changed," etc. Now, I will admit that there should be provision for the change of location of poles, as tracks are changed, so that the railway company would not have to go to court to fight it out, but that "shall desire" does not set well with me. I don't think that that is right. I don't think that you should ask that of the power companies. That again puts the railway company in an absolutely arbitrary position.

That wording should be something after the fashion of "necessity requiring," or to that effect. Then the power company would have some show against any arbitrary action due to any unreasonable notion the officials might take, or any desire on the part of the railway company to hamper a particular power company, which is a very possible thing in these days of varying interests permeating from one end of our country to the other.

Then, again, paragraph eight of this agreement says: "This license shall not be assigned by said licensee without the written consent of the railroad company having been first obtained."

We can't see what difference it makes to the railway company if this crossing is put up in accordance with this agreement, and the successor would have to live up to that agreement necessarily as it did before. What difference does it make to the railway company whether it changes hands or not—you have your agreement to protect you? You reserve the right to change hands, and if necessary to assign your property, and yet you want the especial power to prevent the power companies doing that if you choose to exercise it. I can't see any reason for that.

Then paragraph nine of the agreement, concerning the right to terminate this license at any time at the end of a certain number of days or months. Our companies can't go out of business in that way, any more than a railroad company can, at the end of a certain number of days or months. When they build a power line they do it for the purpose of supplying users, and they undertake to supply those users' from day to day and from year to year; otherwise they could not get any business. They certainly could not do that if they were required, at the option of an officer of a railway company, to take down their lines and go out of business inside of any number of weeks or months. I can't see any object in that clause being there.

An agreement to put up a crossing in accordance with the specifications and maintain it in accordance with those specifications is in my mind complete, with such other precautions as in a legal way might be necessary to enforce in connection therewith, but why give this opportunity for arbitrary power, so far as the railway company is concerned, I can't see.

Now, as I said before, I am speaking of the things that occur to me as objectionable from the power company's standpoint. There are other things in the agreement and specifications that are desirable, but I don't know as it is necessary to take the time to speak of those. There is one thing I would mention. The idea of doing away with all unnecessary structures and simply build the power line itself, substantially and safely, and have no additional materials there, which are as much of a menace as the power line itself; that does seem to have become the general notion with all those who have thought on that subject, and it does seem to be, so far as I am concerned, the only right way of looking at it. A proper cable can be put up as reliable as anything that can be put up in connection with it, and two things are certainly worse than one.

The only other suggestion which I have to make is that it

seems to me desirable that a matter of this sort, which is very important and which concerns the power companies and the railway companies equally, as I look at it, should be submitted to a joint committee of the various bodies that are interested in this matter—the American Institute of Engineers, your own association, and such associations as are proper to represent the railway company fully in the matter. I am not competent to say whether this is the one to do that in connection with the railway companies; possibly the chief engineers should be represented in conjunction with the association, and the National Electric Light Association should be represented, and all national organizations in a joint committee; they might think these things over and get together and get out a form of agreement and specifications which in their technical points would be satisfactory to all. I believe that could be done, but as this stands it seems to me too much one-sided; in order to have harmony, it is necessary to have a general specification apply, no matter who was there first, so far as the general idea of the thing is concerned, and no technical matters in regard to the engineering and methods of construction; no matter who was there first, no matter whether it was a public crossing or not. Do that, and then if those things must be taken up, why, let that be done afterwards as the special case demands.

I wish very strongly to present that idea of the desirability of a joint committee, and request that you give it earnest consideration. I believe that in the end it will be beneficial to all parties concerned. I thank you, gentlemen.

Mr. Bennett: I am sure that the association and those present are very grateful for the frank and full criticism of Mr. Scattergood. We want to hear from you, all the comments and criticisms you have to make, and we hope some more of you have some in your pockets.

Now, it is a maxim of the law that none can sell that which he hath not in his possession, nor can anyone give a better title

than that which he hath. The best title which a railway company has to any land that it occupies is based upon its charter to conduct the business of railroading and transporting over it. Really in many cases it holds large parts of its land solely by reason of the fact that it is a public service corporation, granted the right of exercising eminent domain, a power delegated by the state, so that it may serve the people. That applies to public highways, streets and other public lands which a railway is permitted to use for railway purposes; but it appears to have been the practice, and the doctrine of our courts, that to a certain extent, when a railway company goes as Richard Roe to John Doe and agrees with John Doe to take over the title in fee simple of a piece of land, to be owned and used by the railway company, the transaction is regarded very much the same as it would be between two individual persons.

This license is made in the full understanding and acknowledgment of these principles of land tenure. The railway company cannot force the power company to take a license from it to cross the right-of-way on a public highway, street or any other public land, for the railway has no better right there, no greater easement as against the public in general than the telegraph or telephone or power company. In fact, this matter is a question of harmonizing other interests to the mutual advantage of both and the general good of the public.

But there are cases in which the railway is involved that resemble very much, according to the doctrine of the courts, that of the power company which goes to John Doe, the farmer, and desires to carry its line across his fields. The power company, being chartered as a public service corporation, may under the laws condemn a right-of-way, and must pay for it at the agreed price and take it, and John Doe must accept that. Or the power company may elect to rent this ground under some terms of license or lease. In the latter case, it seems to me that the power company itself chooses a landlord, instead of a seller of

real estate. If he elects to choose a landlord, necessarily, he bargains with the landlord for a lease such as the landlord is willing to give, for the price stipulated, and that may involve some restrictions upon the power company.

Now, it is in this sense only that the association's proposed license assumes that the railway company, being first upon the ground, may impose conditions. It cannot impose any conditions unless it has a legal right so to do, and it has no legal right so to do, unless it owns the ground. That may possibly explain to Mr. Scattergood's satisfaction the reason why the railway company puts so many restrictions in these licenses.

It is, indeed, the opinion of eminent counsel for railways in this country that railways must be very careful how they lease or license the use of their rights-of-way or lands to other persons or corporations, particularly for uses not connected with railway companies. In their opinion a very careful examination of their charter is necessary to determine whether they may safely do that, and the consensus of opinion among the counsel is quite strong that it is advisable not to go into that, if an amicable adjustment can be made without doing so, for the reason that something may turn up which cannot be foreseen at the time the crossing is made, perhaps in thirty days, or in fifteen years, which makes it necessary for the railway company to have the place occupied vacated, so that it may be used for railway purposes, or some new appliance may come into use on the railway, or perhaps be enforced by law or economical necessity, and it so becomes desirable that the privilege granted to the power company, which may possibly conflict, should be done away with.

This has seemed to call for some method of cancellation, but is only provided for those things that appear, at least, not to have been foreseen or to have come within the calculations of the company when the license was granted. In other words, the

effort has been to make a plain, clear, specific provision whereby the railway company may cancel such an agreement without necessarily having to satisfy the licensee that it is a case of real necessity. That might raise a debatable question which would greatly delay the necessary improvements or changes.

The license should be regarded as one which the railway company may give in cases where its position with relation to the power company is very similar to that of the farmer whom the power company elects to make its landlord. In other words, as I have stated before, the state is arbitrator. Some states have prescribed how different corporations shall occupy public ground in carrying on their business and what their relative rights to the occupancy and the use of that ground shall be. Some of the states have very well elaborated this question, and some have made provisions that were not very satisfactory. Others have neglected the matter.

I may cite the matter of railway crossings of other tracks. It has become almost the established practice in this country that if a railway bought its right-of-way and was there first, when the second railway comes and desires a crossing, it may not lawfully be prevented from crossing, but it must deal with the first railway as it would deal with John Doe, the farmer. In other words, it must bear the expense, not only in making the crossing, but of thereafter maintaining it.

These matters really are not the product of the study of the committee; they are rather an expression of pretty well recognized principles in the jurisprudence of the country. The license cannot apply, as I said before, except where legally it would apply. Then there is always the remedy of condemnation of the right-of-way, but we seek to avoid condemnation of right-of-way by a power company and to enable it to cross with its transmission lines. That generally makes a more satisfactory ending of the matter to the power company.

You can't always tell how these matters will terminate in court, and I think it is the sense of the association that as a rule, the scriptural advice is the best—"Agree with thine adversary quickly"—I am not very accurate in quoting the scriptures.—"lest he have you cast into jail." You can't always tell; it certainly means delay.

In my opinion business men should try to reconcile their difficulties between themselves on good, fair business principles and make a working arrangement, rather than get into court and be at the mercy of various lawyers, judges and juries.

Now, as to the unreasonable repairs, and the matter of unreasonably ejecting a power company, consent as to assignment, etc. It would be a hard matter to make a license in which the railway company could control to a sufficient extent to enable it to insure the protection of its property, or the protection of its interests, without the insertion of a provision that it would have the right to take the matter into its own hands in case it could not by other means, and notice to the licensee to do what ought to be done, accomplish this end.

It seems to me that that, and those other questions, resolve themselves in the end into a getting together and a harmonizing of the differences. The power companies will have an electrical and civil engineer, and the railway companies will have those officials. They can get together, they can thresh the matter out, and when they have made an investigation, they certainly ought not to be very far apart as to what is really necessary, and it is assumed all along that they are willing to do what is right. I am sure that Mr. Scattergood is just a little afraid that the railway companies will not do what is right—now we feel that we will.

As regards consenting to assignment, there are few landlords who like to license or lease any valuable property without retaining the privilege of consenting to an assignment. You

don't know who will be the assignee, and it may be a party who will not carry out in good faith the agreement which was made by the original party. It is a protective clause which might not have to be used in a hundred years, and it might be very badly needed inside of one hundred days.

The railway company should be expected to exercise prudence in assuming a burden, and that is why it wants to consent to an assignment of the right which it grants in the license.

As to the suggestion of waiting for consultation with other bodies before deciding upon these matters, why, I may cite my own case as a good illustration. Long before our committee had prepared its specifications and the agreement was ready to submit to the association, I had on my hands about 15 or 16 cases of applications from power transmission companies to cross a railway, with lines carrying all the way from 6,000 volts up to 66,000. There had been nothing like it before in the history of the railway, that is, in Illinois, over private right-of-way of the railway. There had been many by the companies who had made crossings on public highways and streets, usually of the lower voltages, but nothing like that. You may see, therefore, how urgent it was that the Railway Telegraph Superintendents should, as a rule, take charge of these matters on behalf of the railway companies and hasten the solution of this question in some suitable form. And I was very glad to get this in time to use it in some of those cases.

Now, the greatest difficulty I found was this: that power companies handling as high as 44,000 volts and building lines that were really beautiful to an engineer, electrical or civil, things to be studied and to find delight in, if a man is interested in the scientific end of his business—these companies had made contracts with engineers and designers and with manufacturers to build their appliances and their power lines and their towers, and selected their forms of insulators and attachments and com-

pleted their preliminary work before they said anything to the railway company about desiring to cross the right-of-way or tracks.

Now, in some instances, they had not planned as we would like to have them construct. It meant a great deal to them if we insisted that where it was a private right-of-way owned by the railway company, it must be done as we wanted the work done,—it meant throwing into the junk pile a lot of valuable material, and then being delayed possibly six months in getting such materials as we wanted them to use, because they could not then get an order in to the manufacturers and have the materials furnished in time: their work was progressing too fast to be subjected to any such delay and loss as that. We compromised with them very largely. We knew that they had not been told that the railways were meeting by specifications the necessity for having some sort of agreement in these matters so as to take care of this thing in an intelligent way.

The railway companies have found that the different companies are not fully aware of or do not realize the necessity for these provisions, and in that regard our experience is just about the same as that of every business man, and is what we can expect from them. It is what every business man expects from every other business man—and that is that they lack the information of our business that we have, they don't understand it, they have not the knowledge of it that we have. Hence these people have gone ahead without consultation and committed themselves. Now, one of the things that we desire to bring about, and as extensively and rapidly as possible, is a realization of the fact that the railways through their electrical departments, are interested in high tension wire crossings, and through the dissemination of this knowledge to create the practice of consultation with the railways before the different companies commit themselves to any given appliance or specifications, materials or styles of construction so far as concerns the crossing itself.

That, I think that Mr. Scattergood or any other gentleman connected with power companies will believe to be a good thing. When it is once known and understood that the railway companies would like to discuss this matter and make suggestions with regard to these crossings, preliminary to coming to an agreement, with the crossing line, that will be acceptable to both parties the matter will be taken up with those intending to cross by the railway officials, the losses and delays incident to the condition of affairs I have referred to will be eliminated, and when the power company starts work, if a particular construction is desired at the particular location in question, it will be fully informed as to what is to be done there, so that both parties interested will have an understanding that will prevent any delays, annoyance or expense that is not really necessary.

Now, we have only one more name here: Mr. Northmore, will you say if there is any criticism you wish to make. Gentlemen, Mr. Northmore, Engineer Los Angeles Gas & Elec. Corporation.

Mr. Northmore: Mr. Chairman and Gentlemen: Mr. Scattergood has covered all the points that I had noted. He has covered them very fully, and I have very little to say. I did make a note or two, however.

Now, I don't believe that you could get any power company or lighting company to sign one of those agreements, without they absolutely had to. As it goes, as a matter of fact, about nine-tenths of the crossings are made at public highways or streets—am I right about that?—all over the country.

Mr. Bennett: I think you are very nearly right, except very high tension.

Mr. Northmore: Would it not be better to get up specifications that would be agreeable to the utility companies as well as the railways, so that we could all work together, and so that the utility companies would willingly use them even on street

crossings, rather than to have something in the way of specifications that we would oppose and would only use where we had to cross your rights-of-way? In other words, I believe in getting together, as Mr. Scattergood suggested, a committee from the National Lighting Association, and the American Institute of Engineers, and the Railway Telegraph Superintendents' Association and make such specifications as would be agreeable to all of them.

Just one other point. I don't see why you class everything above 700 volts as high tension. Why not make a division line at about 6,600 volts. You make the crossing wire too expensive for that voltage where you place the high tension line, the crossing expense is too much for that work. In this connection, I just looked over, roughly, what my company would have to pay to go into these specifications. In the highways and streets, it would cost us \$20,000 to make those crossings, whereas, our crossings, as they are now, are safe, I believe, absolutely safe. Of course, with the conditions that you have in the east, where you have heavy sleet storms, it may be different from here; but for here, I believe, the specifications are too rigid for that class of work. Aside from that, I believe that Mr. Scattergood has covered everything that I had thought of, and covered it very thoroughly.

Mr. Bennett: Well, I can't control your methods of construction on the streets or highways that you speak of, unless we can persuade you to do it as we would like to have you do it. That is regulated by your municipal and state laws. If you say, no, we are not going to do as the railways wish in this regard, they have nothing more to say, but will see to making a different set of specifications to cover that proposition.

Now, Mr. Northmore figures that the requirements for 700 volts or over are too expensive for the lower voltages. Let us try 2,200 volts, let us see how much that would be. (Quoting).

"SUPPORTS: Towers, poles and other structures supporting the crossing span shall be self-supporting or so guyed as to be in effect self-supporting. The licensee's line wires shall not be considered as guys in above sense. For supporting the crossing span, steel towers or poles, erected on concrete foundations or set in concrete, are preferred. Reinforced concrete, or wooden, poles may be used if approved by the Superintendent of Telegraph of the Railway Company."

Now, there is a discretion left in the hands of each Superintendent of Telegraph of the railway company, which discretion he will exercise. He is not going to force you to build a steel tower to carry a line of light voltage, if it is otherwise well and reasonably constructed.

"The towers or poles next to the towers or poles of crossing span, and supporting the adjacent spans, shall be guyed towards the crossing span so that it will be impossible for line strains to be transmitted to the supports of the crossing span." That is common construction, even on a telephone line or a telegraph line.

"The towers or poles supporting the crossing span and the two adjacent spans shall be as nearly as possible in a straight line." It might be difficult to get them in a straight line, but we can always guy them, and then it is a question of guying. Now, what is there unreasonable in that? And I am stating it in detail in that manner, so you may form your own idea as to whether the scheme of construction should be unreasonably expensive in the case of, say 2,200 volt lines; whether there is more than enough there to make it reasonably economical for a safe crossing.

Now, further, with regard to expense: "The crossing span or either of the two adjacent spans shall not be over 250 feet. In all cases the transmission wires shall be dead-ended by means of strain insulators and transmission wires, so clamped to the strain insulator that it would be impossible for the wire to slip, or, in other words, spans are to maintain their individuality"

Now, there is as a part of this license, a portion relating to the plan and elevation—I don't see it in this lot I have here—a portion wherein it is provided that if it is desired to increase the length of a span, or change the location of any of the supporting poles, these specifications may be modified by showing that the span it, for instance 300 feet long, and the location of the poles, their alignment and the angles of the changes of direction in the line shall be shown thereon, as well as the exact location of the crossing itself. On that plan you can make the modifications that are necessary and eliminate any unreasonable requirements in the specifications, regarding expense.

“WIRES: All wires forming the crossing span and the two adjacent spans shall be stranded copper of section not less than No. 4 B. & S. In all cases the stress, factor of safety, etc., shall be in accordance with these specifications.”

Now, let me read you a word or two—or did I read it—from this report of the committee, or rather the chairman's statement with regard to wire:

“Stranded hard drawn copper, or other practically non-corrosive material. Minimum size, equal to No. 4 B. & S. G. solid conductor copper. To be dead-ended on each of the four poles by approved strain insulators, and strung with specified sag in each of the three spans; the size of wire adjustable to length of span and factor of safety.”

Now, as to taking 700 volts as the dividing line between high and low tension. The railroad companies, operators or dispatchers, and probably telegraph instruments and wires are in danger of contact with voltages too high to be safely carried on these wires. Fatalities have already occurred at a range not supposed possible. Fatalities that are surprising, where it was impossible to prove that the voltages were any higher than 220. The underwriters have made a classification of voltages in which 550 is the dividing line between low and high tension. This was

raised to 700 in order to be liberal, but the understanding is that it is about 700. Of course, you may go as high as 110,000, but there is no railway that expects any power company to build as strong a span for 700 as for 22,000 volts.

We tried to accomplish the purpose sought, by drawing the specifications so that they could be modified to suit these varying conditions; hence, if the gentleman criticises it in the matter of expense, why we would like to hear in detail where this expense comes in. It may be that by further explanation that idea can be wiped away.

Now, to hear from the other side for a moment. I would like to ask Mr. Camp, Electrical Engineer of the Canadian Pacific Railway, to tell us what he thinks about the matter.

Mr. Camp: Mr. Chairman and Gentlemen: All that I can say in regard to the specifications drawn up by the Association of Railway Telegraph Superintendents is to make some comparisons with the specifications that are authorized in the Dominion of Canada. Some four or five years ago, I think it was, we began to agitate the question of high tension wire crossings in connection with the railways in Canada, and I think it was about that time that I revived the subject before this association, in order to get information from the various members scattered throughout the United States.

Previous to going before the Board of Railway Commissioners for Canada, which has jurisdiction throughout the whole Dominion, the various railway companies had a meeting in Montreal, with representatives of the various power companies then operating, at least in eastern Canada, and thoroughly discussed the whole subject.

Before this time, we had specified for cradle protection, or something to catch the wires when they fell down, but at that time we concluded it was not the proper protection; that the first construction should be strong enough, or made so strong that it

would not break down under any conditions that might possibly arise.

After reaching an agreement with the power companies, the matter was submitted to the Board of Railway Commissioners, who declined, at that time, to provide general specifications. About the same time, we had a controversy with the telephone companies regarding low tension wires. We agreed together ultimately on all but a few points, and they decided to submit a test case to the Board of Railway Commissioners. The Board appointed a day for a hearing, and advised the low tension companies—that is, telephone and telegraph, and so forth—to be represented, and also notified the railway companies to be represented. After giving every one present a full opportunity to state their views, the board drew up a set of specifications, but they proved to be rather wanting in some respects, and the high tension question having come forward more strongly, the board then drew up last year—that is, a year ago last spring—a set of proposed specifications and submitted them to the various companies interested.

After various consultations between the different companies concerned, along with the electric engineers of the Board of Railway Commissioners, they finally issued a set of specifications and conditions that are almost identical with those now presented by this association.

As I understand it, the Railway Commission ruled that where a high tension line crossed a railway, either private or public, and did not have any structure on the right-of-way of the railway, that the consent of the railway was not necessary—which is a peculiar ruling—but where a structure was on the right-of-way of the railway and not at a public highway or street, the railway company had to be a party to the agreement, fixing such general terms and conditions as are usual where they lease a portion of the right-of-way for any purpose whatever.

With regard to Mr. Scattergood's remarks about the expense to be borne by the different parties, the specifications of the Canadian Board of Railway Commissioners provide that—well, I will read you this: "In every case in which the line of a railway company shall be constructed under the wires or cables of a telegraph or telephone company, the construction of the telegraph or telephone company shall be made to conform to the foregoing specifications, and any changes necessary to make it so conform shall be made by the telegraph or telephone company at the cost and expense of the railway company."

Now, I presume that the laws of the various states throughout the United States will govern in the same way.

Mr. Scattergood: Do I understand that the maintenance of that would be implied also?

Mr. Camp: No, where the construction is to be changed in order to meet the requirements of the specifications on account of a railway being underneath the wires, the railway company must pay that additional expense.

Mr. Scattergood: The maintenance of that would be greater than it otherwise would be. The power company ought not to be expected to pay that extra maintenance.

Mr. Northmore: It would be less maintenance for all if it is built so the line would not come down.

Mr. Scattergood: I think the maintenance of a costly construction is more expensive than of an inexpensive one. In other words, if you have to pay \$60.00 or \$80.00 for materials in the construction, instead of \$40.00, when you replace those, it is going to cost you twice as much as it did originally.

Mr. Northmore: That is depreciation, it is not maintenance.

Mr. Scattergood: Call it what you please.

Mr. Camp: The board refused to confine themselves by any specification as regards the structure. They provided for test-

ing insulators, the strength of the conductors, stranded cable, etc., almost identical with those conditions you have there, and as for the supporting structure, it is left to the determination of the engineer of the board. I think that is about the only real exception which is made to those specifications.

I might say that this Board of Railway Commissioners have control throughout the whole Dominion of Canada. Not only have they ruled regarding the crossings of railways, but some time ago, the telephone and telegraph lines and companies were brought under the control of the board, and last fall, I think it was, they ruled that the same specifications should apply where one telephone or telegraph company crosses another, so that, although we won against the Bell Telephone Company in our first case, they are very well satisfied now that we did.

I don't know that I have anything further to say on the subject, I simply wished to show that we have already had what you might call a legal decision on this question in our part of the world.

Mr. Lighthipe, Electrical Engineer, Edison Electric Company: It seems to me that this discussion is getting down to the legal rights of the railway company. It is admitted that about 10 per cent of the hazardous conditions are at points which would come under the jurisdiction of the railway, and 90 per cent are at public highway crossings, which, in most instances, as stated, are governed by city ordinance or county ordinance, that provide for certain standard construction. And it seems to me that in view of these facts, that the principal thing to do is to frame some sort of an agreement whereby each of the operating companies would have a voice in the agreement. And I agree with Mr. Scattergood, that this matter should be referred to a joint committee. I believe that in view of the fact that there are 90 per cent of hazardous construction on public crossings, it would behoove the railway to accept something that would be a

good working agreement, that would be in keeping with or approved by the general engineering methods of the various companies. I think that this discussion can go along for hours, and that nothing would terminate it. I should very much dislike to see these specifications and agreement acted upon at this time. I make that recommendation, that it be referred to a joint committee of the various electric bodies interested.

Mr. Camp: Another four years.

Mr. Bennett: I might state that I don't understand that it is the desire of the Association of Telegraph Superintendents to forestall or prevent any further action in connection with this matter, or to refuse to meet on common ground with other parties to the question, and endeavor to agree. Very far from it. We are in the attitude of men who have attempted to solve this problem as best we could, assuming that we were being fair, so far as we could be, and secure safe construction. The question, of course, is open to debate. We are not competent to determine whether or not we have been as fair as we ought to be. We are only human and we may have reached out for something more than the other party thinks we ought to have.

We are agitating the subject, and if the electricians, the engineers of the lighting, power and other companies come to realize the urgency of this question and the necessity of arriving at something like a standard arrangement, something uniform for the country, or even the promotion of legislation, why our purpose will have been served. What we should like to have, and I assume that most of the other companies are like us, is uniform legislation as between states. I don't know of anything more embarrassing than to have a half a dozen different rules and regulations for doing the same thing, and perhaps by getting together we can induce public action in this matter that will be reasonably harmonious. We find now that what little has been done by state legislatures conflicts and makes it necessary to do

one thing on one side of a station, and something else on the other side, neither of which is satisfactory, or what it should be.

Now, as a rule, the construction of large corporations is very good, but there are some small companies operating electric light plants in small cities or villages, which have endeavored to give as large a service in extent as they possibly could, on the least amount of capital, and there has been a temptation there to do this on inadequate construction, that is, construction that is not safe, in order to save money and take in more subscribers

That is the most difficult feature of this question. Traction companies and power companies that furnish power in large quantities have large works and are generally well equipped with capital and well officered with competent men. Our objections are directed against the other class, though we must consider the middle class between these, that are small and to which it would not matter much, as the good construction would not cost them much, and not the class that spend a great deal of money in doing the thing in a first class manner. Between these two extremes there lies a field in which a great deal of work can be done. We tried to embrace them in these specifications, and that is where we found our greatest difficulty in trying to carry them out. I think you would discover if you investigated some of those cases, that they object to some of the things which the electrical and civil engineers of larger companies would unhesitatingly approve as right, and if you can get at the real reason for their objection, it will be found to be the matter of expense, and that it means with them, to build something that is not economical, but cheap—and I make a distinction between the words economical and cheap.

Mr. Lighthipe: I think the suggestion that was made that this matter be referred over to a committee consisting of, say, the American Institute of Electrical Engineers, the National Electric Light Association, and the Railway Engineers and Managers, would be a good thing for this reason,—the board of un-

derwriters have adopted certain fixed, standard rules for wiring; they meet at certain intervals and they adopt standard rules, and the states all over the United States adopt those rules as they are made.

You spoke a moment ago of the different state legislatures making certain specifications for one state that would not apply to another. Wouldn't it be apt to follow, if the specifications were made by a body of engineers that the United States would practically adopt them all over? Last January I attended a meeting of the engineers of the different power companies of the coast, who suggested standard rules of construction, and the coast railways and highways and the managers were up there, and they submitted to the railway managers the matter to see if we could not adopt a standard system of crossings for the states of Washington, Oregon and California, for instance.

We spent two days up there, and we tried to modify our specifications as much as possible and make them as flexible as possible. I am very glad to see that the recommendations you make are practically following out the modern lines of building lines in the first place so that they won't come down. Don't build a support to catch something and then have to build something to catch the support and so on *ad infinitum*, but as long as it is possible to construct high tension wire crossings that are absolutely safe, I think it should be done. And I think that if we adopt a standard crossing like that throughout the United States, why, when we ask permission to cross railway company's rights-of-way, by getting together the proper means of doing it, that it would take a very short time to get the whole matter arranged on a most satisfactory basis.

I have not gone into the legal side of this question and I will leave that branch to be handled by some one who is better prepared to do it than I am.

It seems to me that a standard method of dividing high ten-

sion crossings might be adopted, say one division made with 700 volts, and then another at 27,000, another at 60,000 and another at 100,000. Also there might be one set of specifications adopted for wooden poles, and another for steel poles, and yet another for steel towers. And I think that the lines can be built, and not at very great expense, with a proper margin of safety, so that they will not come down—which will cut out the maintenance item, anyway.

I have not examined into the items of cost particularly in this connection, and I don't know whether the managers of the different power companies have met the railway people, but I know that Mr. Babcock has brought this subject up in a talk before the American Institute of Engineers, saying that everybody is interested.

The main object of that meeting in San Francisco was to get a uniform crossing, otherwise some power company down here who may cross a road is willing to expend, possibly \$6,000 or \$7,000 and build a bridge, and girders under it, if necessary at a high cost. With others it is a different proposition. Now, I notice the other side have certain fixed ideas of how a line should be built and handled. They try to build it as cheaply as possible. The railroad people on the other hand have an idea how the line should cross. They are not quite so particular to have it cheap as to have it safe.

The only way to get together is to have the engineers both from the power companies and the railway companies come together, free and above board, and lay down standard specifications that they both consider safe. And, as I said before, that this can be referred to national bodies of engineers, like the American Institute, the Electric Light Association, and Electrical Engineers, and representatives from the management of the different power companies and the railway managements, and they can definitely decide on the required standard, and fix the specification for the different voltages and different kinds of

crossings, and have them adopted, and then, I believe the cities and the states all over the United States will adopt these as the standard, just the same as they have with the board of underwriters' rules. And then we won't have one city laying down a certain specification for a crossing, and another city 40 or 50 miles off, laying down another, but we will have a more uniform and satisfactory system. I am glad that the Superintendents of Telegraph have taken this matter up. The Superintendents of Telephone companies brought the subject up and have been threshing it out almost all winter, and we have not got quite together yet, nor do I think we will get together until we have all the interests of the power companies and the railway companies get together in a joint meeting and go over carefully the details and fix standard specifications, taking up one case after another, but making the specifications flexible enough to meet local conditions.

Mr. Bennett: More than a year ago, we learned that the Association of Railway Engineers of Maintenance were at work upon this matter, we had begun somewhat earlier than they. I think—and I believe we notified them what we had done and asked them to co-operate with us. It is desirable to be in co-operation with the American Institute of Electric Engineers or any of its officers, on the question of the method of getting together. For those who would like to take notes of the matter. I will say, that the chairman of the committee on this business of the Association of Railway Telegraph Superintendents is Mr. Geo. A. Cellar, Superintendent of Telegraph of the Pennsylvania Railway lines west of Pittsburg, with headquarters at Pittsburg, Pa. Mr. Cellar would be very glad to hear from any of you, and take any suggestions you have to offer as to a practical method of bringing a joint discussion. One thing is certain, we must do it ourselves or the various state legislatures will take it up and it will in all probability be taken up by Congress as a national matter before any great lapse of time. Personally,

I feel that in the end it will all be made a matter of legislation, and if we can prepare the data and the fundamentals upon which that legislation should be based, we will get very much more satisfaction out of the final legislative outcome than we will if it is permitted to drift into the Legislatures and into Congress from other channels.

“The eye of the master is worth more than his hand,” and direct action is preferable to action from a second or third party, who is, perhaps, not directly interested, or, perhaps, not well informed upon the subject he is obliged to handle as a member of a Legislature or a member Congress. In the end that is where our efforts will tend to bring about results. I think we all are agreed that the results obtained should be not only satisfactory from an engineering point of view, but that there should be, as nearly as possible, uniformity for the different localities.

I have here the name of Mr. Stockbridge. We will be pleased to have Mr. Stockbridge make what remarks he wishes to on this subject.

Mr. Stockbridge of Pacific Light & Power Company: I don't believe that I have anything in addition to what has been already said. I will second the suggestion or the idea that the specifications should cover all cases, not alone the private crossings. I think possibly that the electric companies and the telephone companies could come to a satisfactory agreement to both parties, that would cover both public and private crossings, if they go at it, not with the idea of enforcing all the legal rights that they may have in either case.

Of course, the specifications that are submitted as made up by the Railway Telegraph Superintendents are not satisfactory to the electrical engineers of the transmission companies as they understand them. In fact, I understand that they have already been revised at a recent meeting of the telegraphers. The proposition of dead-ending all the wires at all crossings where the

voltage is over 700 volts, does not meet with the approval of the ordinary electrical engineer. I believe the civil engineers who have charge of the mechanical work would like the strain insulators at all crossings. They approve of crossings using strain insulators, that they be dead-ended on each side. In regard to making these crossings dead-ended as is proposed in the specifications, in fact, I believe that the ordinary everyday construction is much stronger than the proposed construction, as it would be put up on low voltage lines. I think that everything else has been covered.

Mr. Camp: Mr. Chairman, I forgot to mention that I have copies of the specifications of the Canadian Board of Railway Commissioners for Canada, and that they apply not only to private crossings, but to all crossings, public highways and everything as well. I just mention this in case some of the gentlemen might have thought it only referred to private crossings. And I would also state that these specifications have the same effect as though passed by Act of Parliament so far as Canada is concerned.

Mr. Scattergood: I want to be sure to be understood that for my part, and I think on the part of all of those of the American Institute who have spoken, that we do not mean to criticise these specifications in a broad way at all, but should like the opportunity to go particularly into them so as to intelligently discuss them here with you. The little time that we have been able to devote to the matter, made it impossible to undertake to do that. That is my feeling at any rate, and I feel at the same time that this joint meeting of a national character would have the effect Mr. Lighthipe has mentioned; he has shown more in detail than anyone else his extreme desire to attend this meeting, which would certainly be of benefit. I am not asking that you do not adopt these specifications in the meantime, if you wish them as an organization, but I certainly would like to have you take some

action in the way of offering a resolution adopting as your sentiment the idea of a joint meeting to carry this on and to get uniformity between the states and the cities in the states.

I think there will be very little trouble about getting together. Of course, it will take time.

Mr. Bennett: I believe that the legal doctrine in this country is so well established that the question really has two phases, one is the legal and the other is the mechanical. Necessarily, those of us who are electrical engineers or telegraph superintendents, etc., would have to defer to the legal departments of both the railways and the power companies to determine all questions as to the restrictions of a license in certain localities. It is unquestionable that the power companies and the railway companies are agreed that public highways and street crossings should be as well protected as private crossings, and the specifications which would thoroughly accomplish the necessary protection at a street crossing, ought to be good enough for any other place. Granting that, there only remains the other question as I have said before, of protection of the legal rights of the property owner in the use of his property—that is not an engineering question at all.

Now, as to a resolution intending to give the sense of those present at this meeting upon this matter, I want to say that it is not a meeting of the Association of Railway Telegraph Superintendents with a regular order of business, but is an informal meeting in which you all have equal rights to offer resolutions and second them and vote for them, and the chair is ready to receive any motion of that character that you may desire to make.

Mr. Davis: Before you go any further with the subject, I would like to say a word in behalf of the telegraph companies. Many of you may have had a good deal the same experience where you have had to deal with applications for permission to make crossings. I have had to deal with numerous of

that sort of applications. Sometimes they come in a little too rapidly to be quite comfortable, and it is perfectly sinful the amount of money which has been spent on cradles and other protective devices which are now regarded as a little worse than useless.

There can be no question that the way to make a crossing is to make the line structure strong. The American Telegraph and Telephone Company through its engineering department has consulted with a great many engineers within the last year or two, and that there is no serious difference of opinion between the different engineers of the telephone and railway companies as to what constitutes good construction.

These specifications appear to permit some latitude in deciding what shall be done with lines of various character, and they seem to at least make a good, sensible attempt to cover the subject. Now, we must have something for the purposes, not only of railway companies but of telephone and telegraph companies, and there is undoubtedly a great deal of construction at crossings which is, today, dangerous.

Now, we can't wait a great while—or should not wait a great while, for specifications that are perfect. We must have specifications that can be used today. It seems to be agreed by all engineers who have dealt very much with the subject, that the only thing necessary is to make a structure which is reasonably strong within engineering limits, and it seems to be agreed that there is no special difficulty in determining the engineering limits that are permissible, and at the same time economical for the case under consideration.

Just by way of parenthesis, I would like to say one word as to a form of construction that has been offered, and has recently been pressed upon me, that I think all engineers object to. That is, a sort of tower construction with room in the center for the passage of telephone and telegraph wires. I think

that is all wrong. I don't think—I am speaking now of high tension wires, where the power line is way up to about 20,000 or 30,000 volts or more—I don't think that the power line structure in those cases should carry the wires that are light and not calculated to bear heavy currents, and I don't think that those wires should pass through the tower structure.

In the east some of the power engineers have offered an extended arm from the side of the tower structure, so arranged that if a power wire falls from its insulator it will be held by this protecting arm, or will be carried beyond the telegraph wire. That protection is not perfect, but I regard it as superior to a method which places the telegraph or telephone lines inside the tower structure. We don't want our men on the tower structures, and there is no reason that they should be there. That is, I can see no good reason why they should be there.

So much for the engineering side of the question. Not being an active member of this association, I have not the privilege of recommending anything in the way of action that is suitable, but it is my judgment that something should be done at this meeting to get these specifications into the hands of power engineers and telephone and telegraph engineers, that they may consider them and compare them with the work that has been done recently—for there has been a tremendous amount of it done—and in that way, I think it will be quite possible to bring about something like a general agreement of what form of construction should be used at crossings.

It is certainly quite possible to suggest that the American Institute of Engineers and others interested have a conference as has been spoken of here and decide upon a set of specifications. I should like to see, not particularly these specifications, but some specifications, placed in the hands of the power, telephone and telegraph engineers that they may use them.

Mr. Bennett: First, I would say to Mr. Davis, that so far as this meeting is concerned, he has the right to offer a motion or resolution, because the same right is extended to any guest who is representing the other side of the question; that is to say, the power companies or the lighting companies. We are acting as a body outside of the Association of Railway Telegraph Superintendents this evening.

Then again, I want to call your attention to the fact that Mr. Davis, being a telegraph man, sees certain deficiencies in methods suggested, and power engineers see certain other things. Now, the aim is to get together and be as fair as possible to all concerned. I have had proposals made to me to plant the supports of the power wires very close to the track on each side, so as to make a span of 25 or 30 feet over the railway track. Now, we don't want them there, neither do we want a tower placed so close to the track that with the traffic constantly passing by it, there is danger of damage by reason of derailed engines or cars, because, though the railway companies try to guard against the railway cars and engines being derailed, they will sometimes get off the track and get into these structures and knock them out. We like to see the supports constructed and placed so as to be as far as possible removed from the tracks in high tension wire crossings, so that the structures shall not be dragged down by derailed engines or cars.

I want to call upon Mr. Groce, who was a member of the committee of the Association of Railway Telegraph Superintendents and has done more or less work on that committee, to talk to us. Gentlemen, Mr. Groce, formerly Superintendent of Telegraph of the Illinois Central.

Mr. Groce: Mr. Chairman and Gentlemen: It gives me a great deal of pleasure as a member of this committee which prepared the form of agreement and specifications, to address you gentlemen since I have heard the comments upon the result of our

labors. It may interest you for me to give you a brief review of the manner in which this movement came about and the conditions which brought about the appointing of the High Tension Committee.

Some five years ago, the numerous cases of trouble on account of poor construction of crossings, telephone, telegraph and electric light wires, was brought to my attention by seeing that our reports showed about 51 per cent of the cases of trouble came from this cause. I consulted the various superintendents of telegraph located in Chicago, and found that the experience of the other roads was much the same, and in talking the matter over, a movement was started which resulted in the Committee on Topics asking me to read a paper before the association at its meeting in Atlantic City two years ago. The high tension proposition was not particularly considered at that time, but as a result of the investigation which we made, and as a result of the action taken at that meeting, the committee which was appointed took up not only the matter of high tension crossings, which it was supposed to take up, but included the low tension crossings.

When the committee was appointed, the first meeting was between the chairman, Mr. Cellar, and myself, and in trying to outline just exactly what we would do, we tried to find some ground upon which we could start. A letter was drafted which was sent to the other members, and a considerable correspondence resulted.

The only national rule that we had to start from was the law of the Underwriters' Association, which divided the low and high tension into three classes. The low tension being considered anything below 550 volts; high tension anything from 550 volts to 3,500 volts; special high tension anything above 3,500 volts, and that still stands, I believe, as the rule of the Underwriters' Association.

Upon a later meeting of more members of the committee, it was decided that on account of the variations of the trolley wires largely used in direct current lines, that a division at 700 volts would probably simplify our work in starting the proposed agreement, which you have before you now. It was on account of the D. C. trolley line service variations from 500 to 650 or 700 volts, that we made this line of demarkation at 700 volts.

The considerations of the committee included not only a consultation with the engineers of telephone and telegraph lines and high and low tension power and electric light lines, but also the lines of the different states, and it was really the intention of the association at the inception of this movement to try to promote legislation in each state that might assist in the protection, not only of the telegraph and telephone wires of the railroad company, but of the telegraph employes and of its different train employes. The combined committee represented railroads upon which, in the period of one year, four men had been killed and eight maimed by wires coming down and dragging them from the tops of trains.

The first trial at securing some legislation was in the state of Iowa, and there the employes of the different railroad companies were requested to ask their representatives in the State Legislature to pass some law that would assist in the protection of trainmen. At the meeting of the Legislature that this was proposed, a law was passed placing the question in the hands of the railway commission. Now, the commission called a meeting of the different companies represented, and each company nominated a representative, and they all met under the supervision of the railway commission. The result of their deliberations was accepted by the commission as the law in Iowa.

Now, at about that time, it was found that the sentiment of the different Legislatures was against any law that would apparently benefit any railway company, and it was thought ad-

visible to abandon our efforts towards obtaining even some legislation that would assist in the protection of the lives of trainmen.

In our examination of this subject, we found that in 21 states there was a law which gave the railway company a certain priority if they were at a crossing in advance of some other public service corporation. Our examination on this point did not extend to the western states. I mean by that, California, New Mexico, and the northern tier of states, so that I am not prepared, today, to say anything about what your laws in California may be.

In the formation of this proposed contract, if the gentlemen will read the "Whereas" they will find that the form of license reads: "Whereas, the licensee is desirous of constructing and maintaining conductors for the conduct of electric current across the right-of-way." With this in view, I don't see why the criticism has been made as to this being a one-sided contract. It is perfectly understood that at public crossings, the railway companies do not own the earth, and that these other public service corporations have a right, and I have never heard a railroad man express any desire to get the better of any other public corporation that wished to cross.

Of course, if this agreement cannot be enforced, it is not applicable, and as it is, the railroad company that is desiring to cross a right-of-way already occupied by some high tension line, finds it is necessary that they secure that right and agree to the terms the high tension line may impose.

The members of the committee called upon their construction men for recommendations and consulted engineers connected with high tension work in western New York, western Pennsylvania, Ohio, Indiana and eastern Illinois. The position criticised in regard to the strain insulators is hardly in accord with the position taken by the engineers of the lines reaching from the Niagara Falls power plants and the power plants in western New York. In fact, it was the opinion given us by those engi-

neers and the people whom we thought had had exceptional experience and could give us good advice, that prompted us to make that recommendation.

The chairman had quite a considerable experience with high tension crossing lines in the neighborhood of Pittsburgh and in Indiana. And as a matter of fact, I should say for him, that he was the most active man on the committee, and from the correspondence and conversations which I had with him, I have got the details of his conversations with engineers, and I know that Mr. Cellar was conscientious in his work, and attempted to secure information from all of the high tension men that were available.

The President in his remarks has covered the ground that the committee would present to you this evening in defense of their proposed agreement. I am somewhat at a loss to talk to you gentlemen of the Pacific coast on this subject. We know that you are pioneers in very high tension lines, and really I don't pretend to know the extent to which your crossings of railway and telegraph lines in California have gone, nor am I acquainted with the laws that you have in the state of California governing these crossings or governing your rights, if you wish to make it a matter of law.

I do think it important that some such agreement as this be adopted and started at an early date. The agreement, and its specifications, I believe to be sufficiently flexible to meet the different requirements, and if the high tension representatives will join the railroad people in some movement towards the securing of legislation, I believe it will be a good thing. I don't think with the gentleman who recommended some action by a joint committee, that that would be adopted by all of the states. I notice that there is quite a difference of opinion as to the details in some of these localities, and I don't think you could get them all together on any one set of specifications.

It is possible that federal legislation will meet this better than any other form of legislation. I feel that it is a matter of far greater importance than some of the federal laws that have been passed at the present session of Congress in Washington.

The Association of Railway Telegraph Superintendents has the support of the chief engineers of the different railroads of the United States. I believe I can say this with all confidence, and there is, therefore, very little use in calling in the engineers of the railroad companies or considering that this agreement should be submitted to them, for, as a matter of fact, it has already been submitted, I think, to most of the engineers.

I wish to say that in these few remarks this evening, I don't pretend to give you the ideas of the commission in general, because I came to Los Angeles unprepared, as to any statement that I would be called upon for, relative to defending the action of the committee, but I would be glad to have all interested consider the fact that this is the commencement of the movement, this is simply the start, and I know that it is the feeling of all of the members that any advice or any desire on the part of the high tension people will be gladly received. The high tension people in general build good lines, it is really only the smaller lines, or some lines that get into financial difficulties, that bring about the troubles, and it is pretty hard to control that by any association of railroad people.

Mr. Lighthipe: In your statement that has been commented on by the various engineers representing the railroad companies here, have they taken into consideration that there are power companies interested, or have they dealt solely with the railroad interests?

Mr. Groce: Well, as a rule the men in charge of that department are broad-minded men, and while they gave their opinions as representatives of the railroad companies, they had no desire to work a hardship upon any of the high tension com-

panies. And by the way, I wish to state that in our figures there, it is shown that more than 90 per cent of the crossings were desired by high tension companies. That does not include California, but all the states east of the Missouri river. The greatest danger is at the crossings of very high tension, and not at public ways,—the high tension people would not desire them to be there—and there is just as much danger at a crossing of killing a trainman or passenger as in other places or on private property that may be owned by the railroad company. I thank you.

Mr. Bennett: In connection with what Mr. Groce has said, I would state that the chief engineer of the Chicago & Northwestern Railway Company, personally, made a careful examination of these specifications, and gave them his autograph signature of approval before they were adopted by the Association of Railway Telegraph Superintendents; this examination was made at my request and ended in a consultation between us, before he gave the specifications his approval.

Now, he brought out some matters that would not have occurred, perhaps to electrical engineers or to a telephone man. Some railways have wooden bridge structures along their tracks and it is necessary to do work upon them with pile drivers, the leads must be erected directly over the bridge in order to operate, and unless a little care is taken in the location of the high tension crossing it may be directly over that bridge, and then there would be no way to operate the pile driver. We might have a wreck directly under a high tension wire crossing. For that reason we called for a minimum clearance of 35 feet. That is not too much for a man who may be obliged to get up on a steel boom or steel rigging of a boom and work directly under a high tension line. I mention these little matters merely to show how many different points there are to this subject.

The Association of Railway Telegraph Superintendents suggested to Prof. Frank Fowle, an electrical engineer of high

reputation, with whom, doubtless, many of you are acquainted, concerning this subject, that he publish the results of his investigations. Prof. Fowle gave the matter considerable study, has published a long report stating the results of his work and investigations, I think, through Van Nostrand & Company, a little work, as I say, giving the result of his investigations and his opinion of various methods of construction, making certain recommendations, and conveying information he thought would be appropriate to adopt as general practice. If any of you who have not that little book desire it, I will say that it is inexpensive and you can carry it in your pocket. It is written by Frank Fowle, entitled "High Tension Crossings," and is published by Van Nostrand & Co., New York. It is quite in line with most of the recommendations of the committee of Railway Telegraph Superintendents. Is Mr. Davis of the Pacific Light and Power Company present? Mr. Davis, will you come up and give us the benefit of your views.

Mr. Davis: Mr. Chairman and Gentlemen: I believe that the efforts of the telephone experts and superintendents are directed in the line of construction. I don't believe that we are very far apart. I think that the discussion has been along the lines embodying the views of both parties. For instance, I think that we should all of us endeavor to use the best methods possible for the protection of life and property, and I realize that there are lots of large companies that are endeavoring to do this, and at the same time, that there are very many small companies that probably would not do so, unless they were compelled to.

In most of the transmission lines built within almost any factor of safety, it must be considered that there is some particular in that transmission line where it is weaker than any other, and I think it should be the endeavor to discover and improve that weak point, now that point seems to be the point of crossing, with high tension companies.

Now, I wish to say that I look for the best results to be obtained, at least, I should think that the best results could be obtained by a joint meeting of a committee of the National Electric Light Association, the American Institute of Engineers, the electrical engineers of the telephone and telegraph companies and this association, if that can be arranged.

As Mr. Lighthipe has said, the electrical engineers of the state of California, have gotten together and have endeavored to prepare satisfactory specifications in a general way that would be applicable to the interests of the power companies and also the railway companies. This was afterwards presented at a meeting of managers of the power companies of this state, to the chief engineer of the Southern Pacific and the local official, Mr. Babcock, and I think that paper which he has intended to present to the American Institute was intended to bring about a discussion that would hasten an agreement between all parties concerned.

I further believe that at almost any time that you might indicate, a committee of engineers from California could meet with the Superintendents of Telegraph, and the other bodies either in the western states or in the eastern states as would seem best. I am quite sure that the Pacific Light and Power Company will enter into such an arrangement.

A Voice: Do I understand that the agreement as presented here is to be adopted and enforced, or do you intend to endeavor to enforce it without the consideration of the other companies, or the other parties.

Mr. Bennett: The license form?

A Voice: Yes.

Mr. Bennett: Where that has been adopted by a railway company, the usual custom is for the company desiring to make a needed crossing to apply for permission to do so, and to main-

tain that crossing. In such case the railway company issues this license in the form drawn by the association, and of course, the company desiring the crossing is at liberty to accept or reject it. If it is rejected and the railway company upon consultation with the company desiring the crossing cannot arrive at a satisfactory compromise, why then there is the legal remedy left to the company desiring the crossing, and they can take that. So far as I know, there is only one case pending in which the license has not been accepted. The objection in that case was, that the license contained a provision which would enable the railway company to revoke it on 30 days' notice. The secretary of the power company raised the objection that such a provision might prevent his company from advantageously disposing of its securities in the market, but the counsel for the railway company said that the provision was inserted merely to preserve to the railway company a preferential right to the use of its right-of-way as against the power company in case necessity should arise that would compel or require a change of location, or possible removal of the line, and that the provision was simply inserted for that purpose, and he did not see how the railway company, under its charter could grant the license in any other form. He did not think it had the right to irrevocably grant away the privilege desired.

Mr. Manahan, Los Angeles City Electrician: The only thing that I can see that would be likely to bring about disputes in connection with this matter would be in the event that the local superintendent in the district demanded when an application was made for a crossing, an abnormal expense for that crossing, an expenditure that seemed to the power company to be unnecessary. I think that Mr. Babcock himself is a little afraid of that point, if I remember his statement correctly. And it must be conceded that the higher officials have their time taken up in a great many ways, and don't always have time to give to the actual details of such an arrangement. For instance, it seems to

me that where the crossings occur on the public highway, that a greater factor of safety is necessary than when it occurs on a private right-of-way. There are a great many instances in this city where there are public roads paralleling the railways, and where the structure would have to be separated sometimes 500 feet, in order to obtain a crossing without placing a supporting structure either on the highway or on the railway's right-of-way. It seems to me that under those circumstances there should be a distinction as to the specifications for crossings. I don't believe that I have any other suggestion to make. I think that we are all endeavoring to obtain the same end. I thank you, gentlemen.

Mr. Bennett: In reply to the gentleman's remarks concerning the possibility of a local official imposing an unreasonable condition, I would say that such licenses are almost invariably signed on behalf of the railway company by its general manager, and it is quite the invariable practice for the general counsel of the company to give approval as to the form, the Railway Telegraph Superintendent to give approval as to the electrical features, and for the civil engineer to give approval of the physical construction. After threshing out these matters it would be difficult, I think, for a local division official to impose any burden that would not be criticised by competent officials over them, if it were unreasonable.

It is not the desire of the railway companies to be unreasonable or to impose hardships, but simply to secure sensible and reasonable construction.

And as to the other point, the absolute necessity for a long span at some given point—I think that a careful examination of the specifications will show that under such conditions, all that is required is to produce the necessary factor of safety. They might give us a shorter than a 500 foot span that would not be safe. We are assuming that the company which desires to

cross is willing to be safe, and then it only becomes a question of adjustment between experts whether, in the construction proposed by the crossing company, a satisfactory factor of safety is proposed. They might have a crossing over a 100 foot right-of-way in which the span would be only 110 feet, and necessarily the requirements would not be so rigid. The requirements do not compel you to do the same thing where the span is 110 feet, as in handling the wires of one of 500 feet.

Now, there is one other gentleman from whom we would like to hear something. I understand he is here, Mr. R. H. Manahan, the city electrician.

Mr. Manahan: Mr. Chairman and Gentlemen: I can hardly see where a city electrician can be particularly interested in railway crossings other than the fact that the safe methods of high tension crossings are, if they are necessary for railway rights-of-way, much more necessary inside of municipalities, as in addition to telegraph instruments and the steel types of passenger cars, we have pedestrians and vehicle traffic to protect as well, and certainly the municipalities are interested in any type of safe construction that may be adopted, and in connection with this discussion of safe transmission crossings, it seems to me that, as has been brought out here this evening, a reference to the various bodies interested, electrical engineers, the National Electric Light Association, the American Institute of Engineers, and the Association of Railway Telegraph Superintendents, would all bring us additional points that would be of value, at least to municipalities in connection with construction of this character.

In regard to the various points that have been raised of the getting together of the Railway Superintendents and the various power companies, it seems to me that if the superintendents are of the type that we have met at this convention, the transmission people should not be at all afraid of fair treatment. And so far as the legal phases of the question are concerned, I shall not make

any statement as to that at all, but this question of high tension wires is becoming more and more a serious one, particularly in these western towns. What is the best to do with these high tension lines coming into a city? What restrictions can we reasonably place upon them? These are points, it seems to me, that will have to be very carefully considered from all sides of the subject. That is all I have to say. Thank you.

Mr. Bennett: I think you gentlemen will all agree with me that we must concede that the railways and the various kinds of electrical companies are all engaged in the grand, productive activities of the nation. There is no phase of the production of wealth—which means the progress of civilization and the general welfare of humanity—that is not worthy of careful, conscientious consideration, because this tendency toward getting the greatest results with the least expenditure of effort, is the one which any progressive nation must keep constantly in view. Wastefulness and extravagance are a national calamity. Economy in production means a greater product for a smaller effort and a greater distribution for a smaller price. This applies to the electrical business just as well as to the railway business.

Taking a broad view of the whole question, the thing to be accomplished is to get the greatest measure of safety at the least cost. We regard it that way, and I have no doubt that all the other interested parties will also.

It is getting to be rather late, almost 11 o'clock, and so far as I know, while there may be other gentlemen whom we should be very glad to hear, we have had a representation from each of the prominent sections, and I will now ask if you have any particular expression to offer on the results of the discussion of this evening?

Mr. Van Etten: It seems to me that the proper way for this association to proceed is to adopt and put in force these specifications wherever they can, and by so doing compel the other

associations to act. We have been trying for three or four years to get them to do something, but have not succeeded.

Mr. Bennett: In reply to that I would say, that the specifications have been recommended by the association and by this committee to railways, individually and generally, for their adoption if they found the license and the specifications fitted for their conditions. With this recommendation went another, and that was, that it would be necessary to meet the power companies and various electrical constructors in a compromising spirit, and to bring about uniformity in an amicable way.

Since there seems to be no further words to be said upon this particular subject, I should like to say to the gentlemen present who are all interested in all matters electrical, that there is present with us tonight Dr. de Forest, the famous wireless telegraph inventor. If Dr. de Forest will be kind enough to take the floor, I should be glad to introduce him to the gentlemen, and I know that all would like just a few words from him, at any rate. Gentlemen, Dr. de Forest.

Dr. de Forest: Mr. Chairman and Gentlemen: I can hardly imagine that it is entirely proper for one to address a meeting held to discuss such subjects as are before you, whose entire business is to work without wires.

I have listened to this discussion with a great deal of interest, not unmingled with pity. I have been up against some pretty tough propositions of my own, but I am very glad to be able to say that this before you tonight is not one of them. I cannot assure you that it is my belief that the solution of this problem which confronts you tonight will be the transmission of power and intelligence without wires, although that has been the dream often published by down town newspaper writers. Certainly there is no immediate possibility of transmitting power in any quantity without wires, and it will be many years before railways will transmit all of their dispatches without wires, although, as I

endeavored to show you yesterday, I do believe that there are opportunities, many opportunities, where the railroads can avail themselves of wireless to help out their systems when required, but by no means to be a constant system of service. In fact, at the present time they would be specially useful in the event of emergencies, when all other methods of communication are interrupted. It is at such times a system of wireless telegraph and telephone communication would be of greatest assistance, as it can exist without the large number of wires requisite in other cases, and it can be made a part of the plant in the manner I described yesterday.

I am a member of the committee on telephony and telegraphy of the American Institute of Electrical Engineers, and as a member of that committee feel authorized to say that the specifications and the resolutions which accompany them—which you will doubtless pass—if sent to us, will receive careful consideration, and would undoubtedly lead to some proposal from them, along the same lines. I thank you all.

Mr. Bennett: Now, gentlemen, thanking you for your careful attention and interest in this matter, I will have the honor to resign the chairmanship to Mr. Dyer, that he may close the meeting.

Mr. Camp: What is the matter with Bennett?

Mr. Dyer: About the only thing for which I wished to resume the chair was to introduce Dr. de Forest. Since that has been done, if there is nothing more before the meeting, we will close. I thank the visiting gentlemen very much for the part they have taken in this discussion. I thank you very much.

FOURTH SESSION.

The meeting was called to order Friday, June 24th, at 9:50 A. M., President Dyer in the chair.

The President: Mr. Secretary, what is the next in order?

The Secretary: Here is a communication dated, Omaha, March 14, 1910, to Mr. I. T. Dyer from Mr. J. B. Sheldon, Superintendent of Telegraph of the Union Pacific Company, on the subject of Standard Specifications for Wiring by Telephone Companies.

NEW BUSINESS.

March 19, 1910.

Mr. P. W. Drew, Secretary, Association of Railway Telegraph Superintendents, Room 306, No. 135 Adams St., Chicago, Ill.

Dear Sir: Will you kindly take the attached papers in hand and place them in the proper channel in order that the subject contained therein may be taken up at our next meeting?

I believe it is a valuable topic for discussion.

Respectfully,

I. T. DYER.

March 4th, 1910.

F-6.

Mr. J. B. Sheldon, Superintendent Telegraph, U. P. R. R., Omaha, Nebr.

Dear Sir: Have you a standard specification for the wiring of way-station buildings for telephones which are installed by Telephone Companies or private concerns who are accorded the privilege of installing instruments for their own accommodation or the interchange of commercial telegrams? If so I should

like to have a copy, but if not don't you think we ought to get up a standard form?

What suggestions have you?

Respectfully,

I. T. DYER, Superintendent of Telegraph.

STANDARD SPECIFICATIONS FOR WIRING BY TELEPHONE COMPANIES.

Omaha, Nebr., March 14, 1910.

Mr. I. T. Dyer, Supt. Tel., S. P. L. A. & S. L. R. R., Los Angeles, Cal.

Dear Sir: Yours March 4th on above subject. The only thing we have to cover work of this kind is contained in our telephone in depot contract forms, of which samples are enclosed. These forms do not go into detail very much, but we have found that they have answered the purpose fairly well.

No doubt some improvement could be made and I would be very glad to have your ideas about it. It may be well to bring the subject up for discussion at our next meeting.

Yours truly,

J. B. SHELDON, Superintendent Telegraph.

Union Pacific Railroad Co. Form 2976.

TELEPHONE ON COMPANY'S PREMISES. (OVERHEAD WIRES.)

MEMORANDUM OF AGREEMENT entered into this day of, A. D. 19...., between Union Pacific Railroad Company, party of the first part, and
.....
.....
successors or assigns, part..... of the second part.

WITNESSETH: The party of the first part hereby gives permission to the party..... of the second part to place, maintain and operate a telephone instrument, free of charge to the party of the first part, in the building of the party of the first part at and to string wire.... connecting with said telephone instrument, across the right-of-way, railroad tracks and telegraph wires of the party of the first part at upon the following terms and conditions:

1st. Telephone instrument to be placed in the building is not to be connected or used for the purpose of communication with places where telegraph offices are operated outside of the of
.....
.....

2nd. The telephone wire.... or conductor.... shall enter the building of the party of the first part through porcelain tubing, and shall be carried to instrument inside of said building on porcelain cleats or knobs. An efficient lightning arrester, with cartridge fuse and a good ground connection, to be approved by the party of the first part, shall be placed near the entrance of wire.... or conductor.... on inside of said building, and all work of wiring shall be done in a safe and workmanlike manner.

3rd. The crossing poles to be of good, heavy cedar, not less than inch tops, and placed in ground standard depth, as follows:

- 25 foot pole not less than $4\frac{1}{2}$ feet.
- 30 foot pole not less than 5 feet.
- 35 foot pole not less than $5\frac{1}{2}$ feet.

40 foot pole not less than 6 feet.

45 foot pole not less than 6½ feet.

50 foot pole not less than 7 feet.

55 foot pole not less than 7½ feet.

60 foot pole not less than 8 feet.

In wet and marshy places where ground is soft or likely to become so by heavy rains, or where poles are to be set on slopes, the poles to be set at greater depth as may be necessary to insure entire safety. The holes for poles to be dug in standard manner, *i. e.*, three (3) inches larger all around than the butt end of the pole. The dirt to be well tamped around the pole as each shovelful is put in the hole. Where possible, the crossing poles to be set in direct line with other poles each side, but where this cannot be done, the crossing poles to be securely guyed or braced as may be necessary to make them secure against side strain

4th. Crossing poles to be placed and maintained at sufficient height so that after being set in the ground proper depth, the lowest wire will clear the rail at least twenty-seven (27) feet, and the telegraph wires of the party of the first part at least five (5) feet, as the same now exists or as they may be hereafter changed

5th. Cross arms, with iron cross arm braces and pins to be used on crossing poles. Crossing poles to be double armed, one on each side of pole, and bolted together at each end with block between

6th. Crossing to be made at right angle with railroad track. The crossing pole to be placed () feet and the crossing pole to be

placed () feet
 of the center of the main track

7th. Such additional fixtures or wires as the part..... of the second part may wish to place on the crossing poles mentioned herein, are to be constructed and maintained according to the specifications contained in this agreement, and the part..... of the second part is to notify the railroad company when any such additional fixtures or wires are to be constructed.

8th. The poles, wires, fixtures, instruments, and appurtenances to be moved, changed or removed entirely, in such manner and at such time as the party of the first part may desire and request, without any expense whatever to the party of the first part.

9th. The poles, wires, fixtures, instruments and appurtenances to be at all times maintained by the part..... of the second part in an entirely safe and secure manner, satisfactory to the party of the first part, and the part..... of the second part agree.... to make such repairs and changes from time to time, at own expense, as the party of the first part shall designate for the safety of the crossing. If the part..... of the second part should fail to make such repairs or changes within thirty (30) days after notice, then the party of the first part may cause same to be made and the part..... of the second part hereby agrees to accept and promptly pay bills for the expense.

10th. The part..... of the second part to be charged with all duty, liability and obligation as to the due and proper construction, maintenance, use and operation of said poles, fixtures, wires, instruments, and appurtenances across railroad company's right-of-way, tracks and telegraph wires, and in and around the railroad company's said property, and for any and all damages,

or claims of damage, in respect to injuries to persons or property occurring in construction, maintenance, use and operation of said property of the second part

.....

The license and permit hereby granted to continue until the day of, 19...., and thereafter until the expiration of thirty (30) days' notice given in writing by either of the parties hereto to the other of a desire to terminate the same. The part..... of the second part hereby accept.... the permit and license above granted, subject to the strict and punctual performance of all of said terms and conditions by on part; and

IN CONSIDERATION of the premises, the said part..... of the second part hereby covenant.... and agree.... to and with the said Union Pacific Railroad Company that will save and keep harmless said Union Pacific Railroad Company from all claims or demands for damages resulting from any injuries whatever, inflicted upon or suffered by said Union Pacific Railroad Company, its agents, employes, or servants, either in person or property and from like damages or claims for damages to other persons or to property which result from anything negligently done or omitted to be done by said part..... of the second part in the construction, maintenance, use or operation of the said property herein authorized to be constructed; and further agree.... that with any termination of this license will remove all of the said property from the right-of-way and premises of the Union Pacific Railroad Company and surrender up the quiet and peaceable possession to said railroad company of all of its property affected by the terms of this license.

IN WITNESS WHEREOF, the parties hereto have caused this license memorandum to be executed in duplicate upon the day and year first above written.

UNION PACIFIC RAILROAD COMPANY,

By.....

WITNESS:

.....

WITNESSES:

.....

.....

Union Pacific Railroad Co. Form 2977.

TELEPHONE ON COMPANY'S PREMISES.

(UNDERGROUND WIRES.)

MEMORANDUM OF AGREEMENT entered into this
 day of, A. D. 19...., between Union Pa-
 cific Railroad Company, party of the first part, and

 successors or assigns, part..... of the second part.

WITNESSETH: The party of the first part hereby gives per-
 mission to the part..... of the second part to place, maintain
 and operate a telephone instrument, free of charge to the party
 of the first part, in the
 building of the party of the first part at
 and to lay wire.... or conductor...., to connect
 with said telephone instrument, in a wrought iron pipe or con-
 duit underneath the right-of-way and railroad tracks of the

party of the first part at

 upon the following terms and conditions:

1st. The pipe or conduit shall begin at a point
 (.....) feet, and terminate at a point
 (.....) feet of,
 and extend in a right angle to, the center of the first or main
 track of the party of the first part. The pipe or conduit shall
 be laid with the top of same not less than three (3) feet below
 the surface of the ground.

2nd. The kind and quality of material used and manner of
 construction, maintenance, repair, replacement and removal shall
 be subject to the approval of the party of the first part; and the
 part..... of the second part expressly agree.... that before
 beginning any work of whatever nature upon or in connection
 with said pipe or conduit, wire.... or conductor...., instru-
 ment or appurtenances, the superintendent of the party of the
 first part shall be notified and may be present, either in person
 or by a representative, to see that the material and work meets
 with the approval and satisfaction of the party of the first part.

3rd. The telephone wire.... or conductor.... shall enter
 the building of the party of the first
 part through porcelain tubing, and shall be carried to instru-
 ment inside of said building on porce-
 lain knobs or cleats. An efficient lightning arrester, with car-
 tridge fuse and a good ground connection, to be approved by
 the party of the first part, shall be placed near the entrance of
 wire.... or conductor.... on inside of said
 building, and all work of wiring shall be done in a safe and
 workmanlike manner.

4th. The pipe or conduit, wire.... or conductor...., in-
 strument and appurtenances to be moved, changed or removed
 entirely in such manner and at such time as the party of the

first part may desire and request, without any expense whatever to the party of the first part.

5th. The pipe or conduit, wire.... or conductor...., instrument and appurtenances to be at all times maintained by the part.... of the second part in an entirely secure and safe manner, and the part..... of the second part agree.... to make such repairs and changes from time to time at own expense, as the party of the first part shall designate for the safety thereof.

6th. The part..... of the second part to be charged with all duty, liability and obligation as to the due and proper construction, maintenance, use and operation of said pipe or conduit, wire.... or conductor...., instrument and appurtenances underneath the right-of-way and railroad tracks, and in and around the railroad company's said property, and for any and all damages, or claims of damages, in respect to injuries to persons or property occurring in construction, maintenance, use and operation of said property of the second part.....

7th. The license and permit hereby granted to continue until the day of, 19...., and thereafter until the expiration of thirty (30) days' notice given in writing by either of the parties hereto to the other of a desire to terminate the same. The part..... of the second part hereby accept.... the permit and license above granted, subject to the strict and punctual performance of all of said terms and conditions by on part; and

IN CONSIDERATION of the premises, the said part..... of the second part hereby covenant.... and agree.... to and with said Union Pacific Railroad Company that will save and keep harmless said Union Pacific Railroad Company from all claims or demands for damages resulting from any injuries whatever, inflicted upon or suffered by said Union Pacific Railroad Company, its agents, employees, or servants,

either in person or property and from like damages or claims for damages to other persons or to property which result from anything negligently done or omitted to be done by said part. of the second part in the construction, maintenance, use or operation of the said property herein authorized to be constructed; and further agree. . . . that with any termination of this license will remove all of the said property from the right-of-way and premises of the Union Pacific Railroad Company and surrender up the quiet and peaceable possession to said railroad company all of its property affected by the terms of this license.

IN WITNESS WHEREOF, the parties hereto have caused this license memorandum to be executed in duplicate upon the day and year first above written.

UNION PACIFIC RAILROAD COMPANY,

By.

WITNESS:

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WITNESSES:

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The Secretary: Mr. President, I would like to say we have several little matters of this kind here that will have to be referred to some committee, and I think it would be well to have a committee appointed of three on miscellaneous matters, and then let all these little matters go to that committee for their report at the next meeting. If they want to they can refer it to some other special committee. And I would make that a motion that the chair appoint a committee on miscellaneous matters.

Mr. Griffith: I second that motion.

The President: It has been moved that the chair appoint a committee on miscellaneous matters to handle the subjects before us, and any other similar matters for which there is not now a committee, or that will not require a special committee. Are you ready for the question?

The question on being put to a vote was carried.

The Secretary: Now, here is another matter—a letter dated Chicago, March 24th, addressed to Mr. P. W. Drew, Secretary, from Mr. John L. Davis, who was then president of the association, and is as follows:

Chicago, March 24, 1910.

Mr. P. W. Drew, Secretary, City.

Dear Sir: I presume we have all received copies of the Western Union circular concerning the numbering of telephone wires.

On a little railroad like the C. & E. I. we have more than 100 short circuits, 47 (94 wires) of which lead from our private branch exchange at Haney.

In my reply to the Western Union Telegraph Company, I have suggested that uniformity might be established on all railroads in carrying out of instructions to number telephone circuits, and I hope to hear further from them in this connection.

I wish you would please put this subject on your docket for discussion at the Los Angeles convention.

Yours truly,

JOHN L. DAVIS, President.

D-M.

CC to Mr. Dyer,

Mr. Cellar,

Mr. Selden,

Mr. Chenery.

Referred to Miscellaneous Committee.

Mr. Camp: Mr. President, I move that this communication be referred to the Miscellaneous Committee.

Mr. Griffith: I second that motion.

The President: It has been moved and seconded that this communication be referred to the Miscellaneous Committee.

The motion on being put to a vote was carried.

The Secretary: Here is another subject of new business, dated Baltimore, June 6th, to Mr. Dyer from Mr. Selden, and some other correspondence attached.

(The Secretary reads the letter from Mr. Selden to Mr. Dyer, dated June 6th, 1910.)

Resolved: That subjects involving legal, transportation, permanent way or traffic questions, or such findings as may require authoritative approval, may be submitted as recommendations to the American Railway Association after having received the requisite affirmative vote of this Association.

Baltimore, Md., June 6th, 1910.

Mr. I. T. Dyer, Supt. Tel., San Pedro, Los Angeles & Salt Lake R. R., Los Angeles, Cal.

My Dear Dyer: Please note correspondence attached hereto from Mr. Arthur Hale, General Agent of the American Railway Association, in reference to the establishment of a working arrangement between that Association and the Association of Railway Superintendents of Telegraph.

I think it the most desirable connection to make, and if it so happens that I shall not be able to attend the meeting at Los Angeles, I hope you will see your way clear to pass a resolution to provide that the necessary amendment to the constitution should be had at the next annual meeting. This would admit of our getting in line with the A. R. A., and if the time had not been

so short, of course, we could have given notice of the amendment and, as my letter indicates, we could not do that constitutionally at this time.

I think you will find that most any of the members would be in favor of such a resolution.

I still have hopes of being able to go to the meeting, but have just outlined the placing of block systems by stringing wires for telephone and telegraph, both, on 1,000 miles of our system, and the progression under our new President, Mr. Willard, is keeping us all busy, and I have the block rules on hand, and it looks very dubious as though I could afford to go to the meeting, even if it was a matter of taking me away for four or five days.

I hope, however, that I may be able to get out. There is no place in the world that I like better than Los Angeles and its region, there is no Association that I like as well as ours, and there is no man in the Association that I like better than you, so that everything that is possible for me to do to get there will be done, but, unfortunately, there is a whole lot of things that are just coming to a head during the month of June.

With kindest regards to you and your family.

Yours truly,

C. SELDEN, Superintendent of Telegraph.

Baltimore, Md., June 6th, 1910.

Mr. J. C. Johnson, Supt. Tel., Penna. R. R., Philadelphia, Pa.

Dear Sir: Replying to your favor of June 2nd,—

I thank you for the information contained therein and return herewith the attached correspondence from Mr. Patterson.

I have had correspondence with Mr. Arthur Hale, the General Agent of the American Railway Association.

At present the Constitution of the Association of Railway Superintendents of Telegraph does not admit of an amendment

such as would be necessary to secure the affiliation, but I have written to the Vice President of our Association, and doubtless there will be a resolution offered at the meeting at Los Angeles, June 20th to 24th, providing for the amendment of the Constitution at the next annual meeting. It is necessary to do this because the time between now and the meeting is so short that the Constitution could not be amended in accordance with its provisions, but the resolution named would put the matter in such position that we could affiliate with the A. R. A. and change our Constitution in a legal way later on.

Yours truly,

C. SELDEN, Chairman, Eastern Division.

Copy to:—Mr. I. T. Dyer, Los Angeles, Cal.

Mr. A. Hale, General Agent, American Ry. Assn., Grand Central Station, Chicago, Ill.

Chicago, May 9, 1910.

My Dear Mr. Selden: Would it be wise, in your judgment, to consider at this time, the establishment of a working arrangement between the Association of Railway Telegraph Superintendents and the American Railway Association?

You will, of course, know whether there are any questions in hand or in contemplation which would make such an arrangement desirable.

Yours truly,

A. HALE, General Agent.

Dictated.

May 20, 1910.

My Dear Mr. Hale: I should very much like to see the establishment of a working arrangement between the American Railway Association and the Association of Railway Telegraph Superintendents, and have hoped to see it for years.

The gentlemen comprising that Association have felt that they have been rather ignored, as it were, probably because the

telegraph on the railroad was considered more as an auxiliary to train movement than otherwise.

Outside of the question of the use of the telephone for train dispatching purposes, I know of no particular question in hand at this time that would make the arrangement more desirable than it has been on their part heretofore, but I am sure that any action looking toward a working arrangement would be the cause of great satisfaction to the Association, which has its next annual meeting on June 20, 1910, at Los Angeles, Cal.

Yours truly,

C. SELDEN, Superintendent of Telegraph.

Mr. Arthur Hale, General Agent, American Ry. Assn., New York, N. Y.

New York, May 25, 1910.

My Dear Mr. Selden: I have yours of the 20th in regard to the Association of Railway Telegraph Superintendents.

The Master Car Builders' Association and the Association of Transportation and Car Accounting Officers have recently become "affiliated" with the American Railway Association by changing their Constitutions. I enclose the Sections of the Constitutions in question, and would suggest that it be arranged that the Association of Railway Telegraph Superintendents make a similar change in its Constitution. With an arrangement of this kind, I feel that the Committee on Transportation of the American Railway Association would likely refer questions to the Association of Railway Telegraph Superintendents and consider recommendations from it. Could not this be arranged.

Yours truly,

A. HALE, General Agent.

Mr. Charles Selden, Supt. of Telegraph, B. & O. R. R., Baltimore, Md.

Article II, Section 2, of the Constitution of the Master Car Builders' Association reads as follows:

"Subjects involving legal, transportation, permanent way or traffic questions, or for any other reason requiring such action, may be submitted as recommendations to the American Railway Association."

Article III, Section 2, of the Constitution of the Association of Transportation and Car Accounting Officers reads as follows:

"Such findings as may require authoritative action shall be submitted as recommendations to the American Railway Association after having received the requisite affirmative vote of this organization."

Mr. C. Selden, Supt. Telegraph, B. & O. R. R., Baltimore, Md.
FML-BB.

Dictated.

May 27, 1910.

My Dear Mr. Hale: Replying to your favor of May 25th.—

I wish to forward the sections of the Constitutions of the Master Car Builders' and other Railroad Associations to the Vice President of the Association of Railway Superintendents of Telegraph, and request that same be brought up at the annual meeting in Los Angeles next month, and have no doubt but that they will act in accordance with it.

I am not quite sure, however, that the Constitution admits of an amendment without a notice such as we could not give now, but if that is so, could we not by resolution at this meeting cover the matter—the resolution to provide that it be incorporated as an amendment to the Constitution at the next annual meeting, or something of that character.

I would be obliged to you for a reply, so that I can send all the correspondence forward, as it is more than probable I cannot attend the meeting.

Yours truly,

C. SELDEN.
Superintendent of Telegraph.

Chicago, June 1, 1910.

My Dear Mr. Selden: Replying to your letter dated May 27th.

I find that Article 8 of the Constitution of the Association of Railway Telegraph Superintendents reads as follows:

"This Constitution may be amended at any annual meeting by a two-thirds vote of the members present, the proposed amendments having been submitted in writing to the Executive Committee and a copy having been sent to each member by this Committee thirty days prior to the meeting at which they are to be considered."

Your surmise that advance notice of proposed changes is necessary is correct and your suggestion to cover the matter of affiliation by resolution, same to be incorporated as an amendment to the Constitution at a later meeting would appear to accomplish the desired end without the delay that will otherwise occur through inability to give the requisite advance notice.

Yours truly,

A. HALE, General Agent.

Mr. Chas. Selden, Sup't Telegraph, B. & O. R. R., Baltimore,
Md.
L-B.

The Secretary: Now, Mr. Selden recommends that some resolution of this kind be proposed toward establishing a work-

ing arrangement between this Association and the American Railway Association.

Mr. Williams: Which is *the* Association of this country? It is composed of all the railroads of this country, and is attended principally by our general managers. I think it is well and desirable that we should have some working arrangement by which we can go to those people. We have been without this up to this time, and we have been embarrassed very much in getting our Association matters up to those general managers, and I believe a committee—some action should be taken along that line. Whatever seems necessary.

Mr. Camp: Mr. President, I would move, therefore, that this matter be referred to the Miscellaneous Committee, with the recommendation that they draft out an amendment to our Constitution in time to submit at our next annual meeting.

Mr. Griffith: Second it.

Mr. Rawlins: Perhaps it would throw a little light on the matter if Mr. Hales' communication is read. What sort of a connection is proposed to be made with the American Railway Association?

The President: It is simply a matter of recognition. The Master Car Builders' and the Car Accountants' Association have already passed resolutions forming such an alliance.

Mr. Bennett: It won't take but a moment to read this correspondence briefly, or outline it, and then I think the house will have a very good idea of the matter.

(Mr. Bennett reads portions of the correspondence.)

Mr. Bennett: Finally, Mr. Hale proposes that we now pass a resolution similar to one of those articles of the constitution of the other associations, the same to be later made an amendment to the Constitution in the regular formal way, and that is where

the matter stands now. We have often wanted to present matters or recommendations to the General Managers' Association, but we had to take the initiative and go before them and ask them first of all whether they would like to receive such things, and now they have taken the initiative step and asked us to get in a position where we can do these things. I think it would be a very good thing to work it out, and I suggest that Mr. Williams prepare a brief resolution that would cover the purpose and present to the house.

Mr. Camp: In addition to the motion I made, I suppose that motion I made will still have to be carried out.

The President: Not necessarily.

Mr. Bennett: Pardon me; we were debating Mr. Camp's motion, which has been made and seconded, and the action which I propose would not be exactly harmonious with Mr. Camp's motion, it seems to me. Now, it would be better to have some one prepare the resolution, in order to gain time. With the consent of the house Mr. Camp and his second might be willing to withdraw their motion.

Mr. Camp: We withdraw the motion then, Mr. President. in favor of the motion by Mr. Bennett.

Mr. Bennett: Suggestion. •

Mr. Camp: Make a motion of it.

Mr. Bennett: This is my idea that perhaps the chairman would like to adopt that suggestion to let somebody first draw the resolution so we would have it in proper form to put to the house and second it.

The President: Mr. Williams, will you draw a resolution covering this?

Mr. Williams: Yes, sir.

The President: Gentlemen, Mr. Griffith has a few remarks to make concerning a matter in which we are all interested.

Mr. Griffith: Mr. President and Gentlemen: There has been a story going the rounds of the press in connection with the passing away of one of the oldest railroad stations in this country. The story has awakened a great deal of interest among a number of old time telegraphers and they have written me on the matter suggesting that some action be taken by this Association to commemorate the birth of the telegraph in railroad operation. In 1847 and 8, I believe, Alonzo B. Cornell erected a telegraph line from New York City to several points in New York state on a highway paralleling the Erie Railroad. That telegraph line consisted of a single wire running from New York City on the east side of the Hudson river to a point opposite Piermont, about thirty miles north of New York City, where it spanned the Hudson river—that was before the day of submarine cables. It was erected for commercial service. It was found that the telegraph receipts in those days were so small that they could not afford to employ a telegraph operator to handle it at the various stations. Therefore, they made an arrangement with the Erie Railroad whereby their station agents should also act as the agent of the Cornell telegraph line, and it was while that system was in vogue that Charles Minot, then general superintendent of the Erie Railroad, discovered the usefulness of the telegraph in railroad operation, and I will read for you an extract from the history of the Erie Railroad. It might be stated that the Erie Railroad was the first railroad connected with the lakes, hence the name which is given it. "Between the Ocean and the Lakes."

EXTRACT FROM EDWARD HAROLD MOTT'S HISTORY
OF THE ERIE RAILROAD, ENTITLED "BETWEEN
THE OCEAN AND THE LAKES." PUBLISHED BY
JOHN S. COLLINS, NEW YORK, IN 1900.

To Charles Minot belongs the honor of having made the first practical application of the telegraph to railroading, either in this or any other country, by his adopting it in the early autumn of 1851, as near as the date can be now fixed, to the running of a train by telegraphic order, which led to a system that was adopted by railroads throughout the world, and remained the standard signal and reporting system on railroads until the block system began to take its place, ten years or so ago. Up to the time of Minot's initial experiment with telegraph orders, trains on the railroad were run on what was called the "time interval system." The rule was that a ruling train had right of one hour against the opposing train of the same class. Trainmen were anxious to get through. As an instance of this, once Conductor Henry Ayres had lost his hour at Pond Eddy. He took the switch, and after waiting ten minutes, as was the rule, and the opposing train not being in sight or hearing, he started a brakeman with a red flag, and giving him twenty minutes' start, followed with his train. A little west of Shohola he caught the flagman, who had stopped on enough straight line to make it safe. The exhausted man was taken aboard the train and a fresh man started on with the flag, which operation was repeated until the train expected was met at Callicoon, thirty-four miles from Pond Eddy. Captain Ayres used to say that he had flagged the entire length of the Delaware Division more than once.

W. H. Stewart was running the west-bound express train on the day when Superintendent Minot made his astounding innovation in railroading—he happened to be going over the road on that train. The train, under the rule then existing, was to wait for an east-bound express to pass it at Turner's, forty-

seven miles from New York. That train had not arrived, and the west-bound train would be unable to proceed until an hour had expired, unless the tardy east-bound train arrived at Turner's within that time. There was a telegraph office at Turner's, and Superintendent Minot telegraphed to the operator at Goshen, fourteen miles further on, and asked him whether the east-bound train had left the station. The reply was that the train had not yet arrived at Goshen, showing that it was much behind its time. Then, according to the narrative of the late W. H. Stewart, given to the author in 1896, Superintendent Minot telegraphed as follows, as nearly as Stewart could recollect:

To Agent and Operator at Goshen:

Hold the train for further orders.

CHAS. MINOT, Superintendent.

He then wrote this order, and handed it to Conductor Stewart:

To Conductor and Engineer, Day Express:

Run to Goshen regardless of opposing train.

CHAS MINOT, Superintendent.

"I took the order," said Mr. Stewart, relating the incident, "showed it to the engineer, Isaac Lewis, and told him to go ahead. The surprised engineer read the order, and, handing it back to me, exclaimed:

"'Do you take me for a d—n fool? I won't run by that thing!"

"I reported to the Superintendent, who went forward and used his verbal authority on the engineer, but without effect. Minot then climbed on the engine and took charge of it himself. Engineer Lewis jumped off and got in the rear seat of the rear car. The Superintendent ran the train to Goshen. The east-

bound train had not yet reached that station. He telegraphed to Middletown. The train had not arrived there. The west-bound train was run on a similar order to Middletown, and from there to Port Jervis, where it entered the yard from the East as the other train came into it from the West."

An hour and more in time had been saved to the west-bound train, and the question of running trains on the Erie by telegraph was at once and forever settled.

When the system of running trains on the Erie by telegraph was well established, a code of signals or signs for stations was adopted, such as "PO" for Port Jervis, "XN" for Lackawaxen, and so on. With some modifications this abbreviated nomenclature is in use to-day.

Mr. Griffith: Now, gentlemen, that is the history of the birth of the telegraph in the railroad service, and I should like to offer this resolution:

Whereas, The fact has been established that railroad operation by telegraph was conceived by Charles Minot, General Superintendent of the Erie Railroad, in the autumn of 1851, and the first telegraphic train order was issued from Turner, N. Y., Station in that year, it is befitting the Association of Railway Telegraph Superintendents, and the Old Time Telegraphers and Historical Association to recognize that great epoch in Railroad and Telegraph History. And, whereas, the story of the passing of the old Turner, N. Y., Station on the Erie Railroad is now going the rounds of the press, awakening in the minds of the pioneer Railroad and Commercial Telegraphers fond recollections of their early days; therefore,

Be it Resolved, That the Association of Railway Telegraph Superintendents, and the Old Time Telegraphers and Historical Association, the latter concurring at their next annual meeting in September, shall appoint a joint committee of five to raise a sufficient fund by popular subscription, to erect, and shall erect,

a monument with suitable inscription commemorative of the event, on the site of the original Turner, N. Y., Erie Railroad Station.

And be it further Resolved, That John B. Taltavall, of the Telegraph and Telephone Age, shall be a member of that joint committee, and is hereby authorized to receive and acknowledge subscriptions through the columns of his journal or otherwise.

Mr. Griffith: Now, in connection with that resolution, before it is moved, Mr. President, I would say that I took the matter up with the Secretary of the Old Time Telegraphers' and Historical Association. He endorsed my copy of this paper to Mr. W. J. Lloyd, president of the Old Time Telegraphers' and Historical Association, Chicago, and for his information says: "I think the suggestion of Mr. Griffith a good one and heartily concur in the resolution. Please forward the papers to him at Los Angeles, with the request that they be returned to me for presentation to our meeting if you approve." Mr. Lloyd writes me here and says: "Referring to the attached papers, I am heartily in accord with the idea embodied in the proposed resolution. If it passes through the Railway Association, kindly return all papers to Secretary Sherwood, New York, that it may be brought before the Old Timers' meeting in Chicago next September. I trust that you and all others visiting Los Angeles will have a real good time, and that you may all meet again in September with the Old Timers. W. J. Lloyd, President."

The President: Gentlemen, I would be glad to hear a second to that resolution.

The Secretary: I second the adoption of the resolution.

The President: It has been moved and seconded that we adopt the resolution presented by Mr. Griffith. Are there any remarks?

Mr. Bennett: Mr. President, when we are making railroad history we ought to be accurate, and the question has arisen in my mind—he stated there that this is the first instance of railway operation by telegraph. I wanted to ask—that was before my time, I guess—whether or not the telegraph was used in railway operation, but not for train dispatching until this. If it were used in railway operation in the general transaction of railway business, then it seems to me the phraseology ought to be altered a little bit to make it appear that this was the occasion where the telegraph was first added for the movement of trains.

Mr. Griffith: It was the first time the telegraph was used in railroad operation. It was my intention to convey that thought in my preliminary remarks by giving you a little history of the Cornell lines on the highway along the Erie Railroad, where as a matter of economy the railroad agent was made the agent of the telegraph company, and there was no railroad operation by telegraph prior to Mr. Minot's order. It is true that occasionally the operators along the line would inquire if train so and so had arrived as yet, but there was absolutely *no railroad operation* by telegraph prior to Mr. Minot's order.

Mr. Bennett: Thank you; that is what I wanted.

The President: Gentlemen, it has been moved and seconded that this resolution be adopted by the Association, and a committee appointed as outlined by Mr. Griffith.

The motion being voted upon was carried.

The President: I will appoint on that committee E. P. Griffith, Charles Selden, W. J. Camp, E. A. Chenery and J. B. Taltavall.

Mr. Williams: Mr. President, I beg to submit the following resolution suggested by Mr. Selden:

Resolved, That subjects involving legal, transportation, permanent way or traffic questions, or such findings as may re-

quire authoritative approval, may be submitted as recommendations to the American Railway Association after having received the requisite affirmative vote of this Association."

Mr. Bennett: Mr. Chairman, I second that.

The President: You place that in the way of a motion or a resolution?

Mr. Williams: And a motion.

The President: It has been moved and seconded that the resolution just read by Mr. Williams be adopted. Are there any remarks?

The motion being voted upon was carried.

Mr. Bennett: Mr. President, I move that this matter be presented to the Executive Committee that they may take the formal steps to incorporate it as an amendment in the Constitution.

Mr. Camp: I second that motion, Mr. President.

The President: You have heard the motion, gentlemen. Are there any remarks?

The motion being voted upon was carried.

Mr. Griffith: Mr. President, I want to make an announcement. I might announce for the information of all members, active or associate, members of the press, or any of you, if you desire a copy of the extract of the history "From the Lakes to the Ocean," pertaining to the birth of the telegraph in railroad operation, there are ample copies on the desk here from which you can help yourself.

The Secretary: Here is a telegram from New York, dated June 23, to I. T. Dyer, President of the Association:

816CH. NX. 49-N.L..
New York, June 23, '10.

M. I. T. Dyer, Prest. Assosiation Redlands Telegraph Supts.,
Los Angeles, Cal.

Please accept right hand of fellowship from American Institute of Electrical Engineers and my congratulations upon your selection of Los Angeles as your meeting place. Am busily engaged in preparations for annual convention in the White Mountains next week, but my thoughts are with you and I send hearty greetings.

RALPH W. POPE.

435a June 24.

The Secretary: I move that it be printed in the minutes with the other communications.

Mr. Williams: I second the motion.

The President: Gentlemen, it is moved and seconded that this communication be printed in the Proceedings, together with other similar communications. Any remarks?

The motion being voted upon was carried.

The Secretary: I have another matter of new business. A letter dated Decatur, Illinois, May 17, to John L. Davis, President Superintendents of Telegraph, Chicago, Illinois:

CIPHER CODE.

Decatur, Ill., May 17, 1910.

Mr. John I. Davis, President Association Railway Telegraph Superintendents, Chicago, Ill.

Referring to the enclosed letter, which I have also sent to some other telegraph officials upon instructions from our management to recommend a cipher code for company use with a

view to reducing the volume of traffic on the railroad wires and the cost of telegrams sent over franks.

Formerly secrecy was the primary object of code service, but this has changed to one of economy under present conditions.

I have not seen the code brought out by the American Railway Association, but am told that it is too bulky and cumbersome for general or economical use, and in view of the fact that a code of this kind is valuable to the extent that its use is general, I suggest that this be a subject for discussion at the Los Angeles meeting of the association, which I have all along hoped to attend, but do not now expect to be able to do so.

G. C. KINSMAN,
Superintendent Telegraph.

Decatur, Ill., May 17, 1910.

Mr. John I. Davis, Superintendent Telegraph, C. & E. I. Railroad, Chicago, Ill.

Have you in use or do you know of a simple, sensible, pocket size cipher code for general railroad use, with the primary object of reducing the length of railroad wire and commercial wire telegrams?

The value of such a code to us will be enhanced to the extent that our connections use it, and by the time saved in preparing and translating code messages.

Does your experience with cipher codes justify their use for the purpose named?

G. C. KINSMAN,
Superintendent Telegraph.

The Secretary: I would make a motion it be referred to the Miscellaneous Committee.

The motion being seconded and put to a vote, was carried.

The Secretary: Just one more matter. The meeting which we had last evening, of course, was not a regular meeting of this

association, and it occurred to me that the minutes of that meeting ought to be made a part of our minutes, and I make a motion that they be incorporated in the minutes of this meeting.

Mr. Camp: One moment before that is put. I would suggest that you amend that that extra copies of that portion be struck off, so as to distribute among the gentlemen who were present here. Will you amend your motion to that effect?

The Secretary: What do you mean, of the whole?

Mr. Camp: I don't think it is desirable to send our minutes of the whole proceedings to the gentlemen who were present at that informal meeting last night, and if the Secretary could arrange to strike off extra copies of the portion they would be interested in, that would be more desirable.

The Secretary: I believe it would be just as economical to send them a copy of our bulletins. Those who have not made remarks, of course, outside people, would not be necessary. I will mention it to the Secretary and will send them if we can get the names.

Mr. Camp: I second the motion, then.

The President: The motion has been made that the minutes of the proceedings last evening be incorporated in our minutes.

The motion on being put to a vote was carried.

The Secretary: I just want to correct a report that I made day before yesterday in regard to the number of new members. We have received at this meeting twenty-six active members and fifteen associate, making a total of forty-one. That is the highest number of any previous meeting. And there were nine names added to the honorary list.

Mr. Camp: By George! You knocked me out by one name. I think we brought in twenty-five at Montreal.

The President: I certainly feel gratified that we have made such a large gain in our membership at this time, and I believe that we will continue to grow as those interested in our business find that it is helpful to them and beneficial to the companies they represent. Anything else, Mr. Secretary?

The Secretary: That is all under the head of new business. Now comes the election of officers.

Mr. Williams: What about those papers?

The Secretary: We have two papers here, by the way—but they are marked for executive meeting. That is the reason I didn't bring them up on this. One of them has reference to the nine-hour law, and the other—well, both of them have reference——

The President: Well, gentlemen, it will be arranged for an executive session just as soon as we take care of the rest of the work now before us.

The Secretary: That cleans up everything I have on the board under that order, Mr. President.

Mr. Williams: Do we vote on the next place of meeting before the election of officers?

The Secretary: Yes, that is the usual program. That is right, excuse me; that should come under the head of new business. We have a number of communications from different places, Mr. President, invitations from various cities for the 1911 convention.

The President: The Secretary will read the communications.

The Secretary. We have invitations from Milwaukee, a letter from Mr. Fry, Superintendent of Telegraph of the Chicago, Milwaukee & St. Paul, and an invitation from the same place extended by the Citizens' Business League, signed by their secretary, and also from the mayor of Milwaukee.

Mr. Bennett: Mr. President, we all know what made Milwaukee famous, but not everybody knows that in the month of June Milwaukee is a very delightful place to spend a few days. We have got Lake Michigan there and one of the handsomest cities in the United States, and has many points——

The Secretary: Mr. President, I would like to rise to a point of order. There is no motion before the house, and I think it would be well to go over all these invitations and then make remarks. I believe that is usually done.

Mr. Bennett: If that is the practice I submit.

The Secretary: I didn't want you to get them all lined up for Milwaukee beforehand.

The President: The point is well taken, Mr. Secretary.

The Secretary: We also have invitations from Seattle, Manhattan Beach, N. Y., Chicago, Boston, Washington—Mr. Selden is in favor of Washington—St. Louis—Mr. Chenery sends a letter asking that we go to St. Louis. And this is the total number of invitations.

Mr. Ghegan: Mr. President, just at this moment we are on this subject, amongst the telegrams received in response to those sent to the absent members, are two bearing on this subject, and with your permission I would like to read them; this, I think, would be the time to read them—just the two. One is from Mr. Chenery, which reads:

“The cordial greetings greatly appreciated. If you can influence convention to meet in St. Louis next year it would soften my disappointment in not being with you at the present time. I wish you all an enjoyable time and successful meeting.”

The other one is from Mr. Taltavall. He says:

“Many thanks for kind remembrances. Sorry did not accompany you. We are all sizzling here and are yearning for

the pure air of Grand Canyon. Keep your eyes on Griffith, Dyer and Camp, and don't let them send next year's convention to Alaska."

Mr. Camp: Mr. President, I will give some idea as to where the meetings have been held in the past. Last year I made up a list taken from the annual reports since the inception of the association. It appears that we have met in Denver twice, namely, 1892 and 1906; in Chicago three times, 1882, 1883 and 1902; in Detroit three times, 1894, 1900 and 1909; in Montreal twice, 1895 and 1908; in Niagara Falls twice, 1890 and 1897; and once each in each of the following places: Omaha, St. Paul, Milwaukee, Indianapolis, Cincinnati, New Orleans, Fortress Monroe, Chattanooga, Wilmington, N. C., Washington, Atlantic City, Philadelphia, New York, Boston, Buffalo, Cleveland and Los Angeles. This makes a total of twenty-nine meetings, considering Detroit as in the western territory, or fourteen in the West and fifteen in the East.

As I believe all the larger part of our membership are located either in Detroit or west of there, I really think that we should select some point in the western territory for this next meeting. I would prefer, of course, having it down in my own part of the country. I just mention these facts to give some idea to the members where we have met.

The President: Thank you very much, Mr. Camp.

Mr. Griffith: Mr. President, just a few words before you start this argument. I would like to call your attention to what I feel to be the necessity in selecting a central point for our next annual meeting. We have met in Milwaukee, Chicago, Indianapolis, and other central cities, and we have in our membership a very active member who has given us a very cordial invitation to his city, and I believe we should give it every consideration. It is one of the most central that we could select, and I am satisfied that if you gentlemen

select St. Louis for your next annual meeting the attendance will surpass any in the history of this association. We have never met there, and I hope that you will set aside any personal comfort feeling in the interest of the success of this association. Think of it well, gentlemen. St. Louis for next year!

The President: Now, Mr. Bennett.

Mr. Bennett: I very heartily agree with Mr. Griffith as to the central point. The only difference I can see is whether it is going to be hot or be cold. Now, we all work very hard at these conventions I have attended, although I have only attended two, but I like St. Louis, and I won't say a word against it in favor of Milwaukee. They both have the one distinctive advantage of being central. The only question between the two, it appears to me, is one of personal comfort. But as St. Louis has never had the convention, and I didn't know that when I spoke for Milwaukee, I just ask you to cancel any remarks I made about Milwaukee, and use your own judgment.

Mr. Rawlins: Mr. President, I want to say a word in regard to the personal comfort side of the matter to apply to St. Louis. I just happened to recall that I attended a convention of railway superintendents at St. Louis in the month of June, and the weather was so cold at that time we had to take our overcoats along when we made an excursion on the river.

Mr. Bennett: Mr. President, I move that the list of places be posted for the inspection of the members, and that we ballot for a place of meeting next year, and that those two places receiving the two highest votes upon the first ballot be balloted again for a decision between them. If there is a tie let us ballot off the tie.

Mr. Williams: I second that motion.

The President: Gentlemen, you have heard the motion.

The motion on being put to a vote was carried.

The President: I will appoint Brothers Camp and Fender as tellers.

Mr. Camp: Previous to collecting the ballots, Mr. President, will you kindly ask all the active members to stand?

(There were twenty-four active members present.)

The ballot resulted in Boston being selected for the next meeting of the association.

Mr. Bennett: Mr. President, I move the vote for Boston be made unanimous.

Mr. Camp: I second the motion.

The President: Gentlemen, I am glad to present the motion. You have all heard it.

The motion was carried.

Mr. Williams: I move the Secretary send a message to Mr. Forristall to get ready.

The motion being seconded and put to a vote was carried.

The President: I will appoint Mr. Griffith a committee of one to send a telegram to Mr. Forristall.

Mr. Camp: We didn't go to Alaska, but I think we went as far away from Los Angeles as if we had.

The President: Here is a telegram just received from Forristall. It is very appropriate just now.

"Boston, 23rd.

To E. A. McClintock, Los Angeles.

At 5:30 P. M. will be with you in spirit."

I don't exactly understand that.

Mr. Camp: It just lacks about five minutes of being 5:30, Boston time.

The President: The next order of business is the election of officers.

The Secretary: Unless you want to finish that Committee on Miscellaneous matters.

The President: I wish to announce the Committee on Miscellaneous matters. Mr. W. F. Williams, Mr. S. L. Van Akin, Mr. F. T. Wilbur, Mr. W. W. Ryder, Mr. George Boyce and Mr. B. F. Frobes.

The President: We will now proceed with the election of officers.

The election resulted as follows:

President—I. T. Dyer.

First Vice-President—J. B. Sheldon.

Second Vice-President—William Bennett.

Secretary and Treasurer—P. W. Drew.

Mr. Bennett: Gentlemen, I take great pleasure in announcing the unanimous election of Mr. I. T. Dyer as President of the Association of Railway Telegraph Superintendents. We all offer him our hearty congratulations, I am sure.

(Calls for "Dyer.")

Mr. Dyer: Gentlemen, I certainly consider it an honor to be elected the President of an association of this character. I particularly feel pleasure at the large vote in my favor. I do not understand, with so much better material in this association, why a better selection was not made. However, I promise you the best I have for the association. I shall endeavor to improve it in any way I possibly can. I again thank you all for the honor.

Mr. Bennett: The chair appoints Mr. Griffith, Mr. Sheldon and Mr. Camp to give formal notice to Mr. I. T. Dyer of his election, immediately.

Mr. Griffith: **Mr. Chairman and Gentlemen:** The chairman has appointed a committee to introduce the sun rising in the east. We might just as well attempt to tell you that the sun rises in the east and sets in the west as to attempt to introduce **Mr. Dyer** to this association.

He has said somewhat modestly and somewhat timidly that he will do the best he can. We know what that is. We have had it right here, and we know what we can expect, and we are all satisfied with the selection made. **Mr. Dyer.**

Mr. Bennett: **Mr. Dyer,** I have the honor to renounce the chair once more in your favor, and in doing so I wish to say that energy is a fine thing for an association of Telegraph Superintendents. I think the nominee that we have selected is wholly reliable and will give the necessary output whenever it is required.

Mr. Camp: Gentlemen, when I was elected President of this association I had the pleasure of being escorted to the chair by **Mr. Dyer**, and I am very glad, indeed, to be able to reciprocate his kind attentions on that occasion.

Mr. Sheldon: **Mr. Dyer,** on behalf of the association I present you with this gavel, to be used impartially and freely when necessary to do so—all respect due to the association.

Mr. Dyer: Gentlemen, I thank you and the committee, and had I made a selection from this room of three gentlemen I would particularly like to escort me to this chair. I would undoubtedly have selected the gentlemen that you have named.

In accepting this gavel I desire to call to your attention that, while it does not appear to be standard, I will endeavor to use it properly and fairly for all concerned.

The Secretary: When a man is elected to an office he usually has to wear the badge of that office, and I will proceed to decorate the President.

Mr. Dyer: I have worn a great many badges, but this is the real one.

Mr. Griffith: Mr. President, I would like to read the telegram I have prepared to send to Mr. Forristall.

"To S. A. D. Forristall, Boston, Mass.

At 5:30 P. M. we felt your spirit and selected Boston as our next meeting point. Congratulations and kind greetings from all."

The President: Gentlemen, I want to ask your patience about making appointment of committees until we have our executive session, because we have got to have the executive session anyway, and by that time I expect to get the names ready to present to you.

And now, if you will give me your attention just a moment longer. Mr. Elliott is here and desires to demonstrate to us a device that perhaps just at this time the High Tension Committee, as well as all the members, will be interested in, and I have stated to Mr. Elliott that we will meet him in the exhibition room at 2:30, and after his demonstration the members and others may have an opportunity to once more look over the exhibits. Remember, gentlemen, that in addition to the exhibition in the banquet room there are three or four other exhibitions on the third floor, and perhaps the exhibitors would appreciate a call on them.

Mr. Sheldon, will you please take the chair?

(Mr. Sheldon takes the chair.)

The Chairman: Gentlemen, what is your pleasure? I would like to entertain any resolution.

Mr. Griffith: Mr. Chairman, your Resolutions Committee begs to make its report.

It is hardly necessary for your committee to make any preliminary remarks on the resolutions they are about to offer, except to say to you that your committee has two separate resolutions, and we would ask you to hesitate after the first resolution has been made in offering any suggestions, as a second one will probably cover the point that you may have in your mind.

Read first:

Whereas, At this the twenty-ninth annual convention of this association, it is the unanimous belief of all members present that it has been one of the most educational, and one of the most profitable to the railways we represent, and notwithstanding the absence of some of our most active members, we have, under the leadership of our presiding officer, Mr. I. T. Dyer, accomplished a great amount of good; and

Whereas, We have been entertained far beyond the measure of our anticipations; therefore be it

Resolved, That the thanks of the association be tendered to Mr. I. T. Dyer, our worthy President, for the able manner in which he has conducted our meetings at Los Angeles, June 20 to 24, inclusive, 1910, and for his untiring and successful efforts in the elaborate entertainment provided, exceeding anything heretofore experienced. Therefore, be it

Resolved, further, that the Secretary be instructed to have this resolution properly engrossed and delivered to President I. T. Dyer.

E. P. GRIFFITH,

W. F. WILLIAMS,

J. M. WALKER,

Committee.

Read second:.

Whereas, The entertainment furnished and the courtesies extended at this our twenty-ninth annual convention, held at Los Angeles, Cal., June 20 to 24, inclusive, 1910, have been so elaborate and magnificent, that be it

Resolved, That the thanks of the association are due and are hereby extended to the several corporations, institutions, committees and individuals who have so materially and freely contributed to the success and pleasure of this meeting, especially mentioning the following:

The Chamber of Commerce,
 The Appliance Association,
 Pacific Electric Railway Company,
 Southern Pacific Railroad Company,
 Los Angeles-Pacific Railway Company,
 Atchison, Topeka & Santa Fe Railway Company,
 San Pedro, Los Angeles & Salt Lake Railroad Company,
 Wilmington Transportation Company,
 The Abbott Kinney Company,
 The Pullman Company,
 Western Union Telegraph Company,
 Postal Telegraph Company,
 Pacific Telephone and Telegraph Company,
 Missouri and Kansas Telephone Company,
 Hotel Alexandria,
 Hotel Maryland, Pasadena.
 Home Telegraph and Telephone Company,
 United States Long Distance Telephone Company,

E. P. GRIFFITH,

W. F. WILLIAMS,

J. M. WALKER,

Committee.

The Chairman: What do you wish to have done with this?

Mr. Bennett: I move that the resolution be adopted.

The Secretary: I second the motion.

Which motion, on being put to a vote, was carried.

Mr. Griffith: Gentlemen, just a moment, please. It has been suggested that we, as a body of telegraphers, having worked at the key ourselves, have been admirably taken care of by the two lady telegraphers in the office in the lobby, and I believe it would be appropriate to express our appreciation of their attention to us by creating a little purse at this time, to be presented to them by Mr. Camp.

Mr. Camp: It has been suggested that a portion of this be given to the lady telephone operators as well as the telegraph operators.

The President: I will consider a motion now to adjourn until 3 o'clock.

Mr. Bennett: I move we adjourn until 2:30.

Which motion was carried.

FIFTH SESSION.

The meeting was called to order at 2:30 P. M. Friday. President Dyer in the chair.

The President: We expect to have an executive session of this association this afternoon, but I feel we should respond to the invitation made by the gentleman a while ago in regard to his device, and therefore, if there is no objection, we will take a recess for thirty minutes and visit the exhibition room, the active members returning to this room for the purpose of holding an executive session at 3:30.

At 4 o'clock P. M. the convention reconvened.

A motion was made and carried that the next convention meet in Boston on the third Tuesday—May 16, 1911.

Upon motion the convention adjourned.

CONTRIBUTORS TO THE ENTERTAINMENT FUND.

United States Electric Company, New York.
 Kerite Insulated Wire and Cable Company, New York.
 Duplex Metals Company, New York.
 The Railroad Supply Company, New York.
 Pocket List of Railroad Officials, New York.
 Standard Underground Cable Company, Pittsburg, Pa.
 National Carbon Company, Cleveland, O.
 Western Electric Company, New York.
 Crouse-Hinds Company, Syracuse, N. Y.
 J. H. Bunnell & Co., New York.
 Northern Electric and Mfg. Co., Montreal, Canada.
 National Dictograph Company, New York.
 General Railway Signal Company, Rochester, N. Y.
 New York Telephone Company, New York.
 National India Rubber Company, New York.
 F. M. Ferrin, Boston, Mass.
 L. M. Ericsson Tel. Mfg. Co., Rochester, N. Y.
 Pioneer Tel. and Tel. Company, Oklahoma City, Okla.
 Weston Electrical Instrument Co., Newark, N. J.
 Edison Mfg. Company, Orange, N. J.
 Electric Storage Battery Co., Philadelphia, Pa.
 Central Electric Company, Chicago, Ill.
 Sandwich Electric Company, Sandwich, Ill.
 Watson Insulated Wire Co., Chicago, Ill.
 National Telephone Selector Co., New York.
 Kellogg Switchboard and Supply Co., Chicago, Ill.
 Roebling Company, New York.

EXHIBITS AND REPRESENTATIVES AT THE CONVENTION.

Numerous interesting exhibits of up to date electrical apparatus were displayed in the large and commodious rooms provided for the purpose.

Mr. J. J. Ghegan, president of J. H. Bunnell & Co., New York, represented the interests of that corporation.

The National Dictograph Company of New York had an interesting exhibit in charge of Mr. Richard A. Fanto, manager of the company.

The Kellogg Switchboard and Supply Company of Chicago, Ill., had an interesting exhibit of their equipment for use in connection with telephone train dispatching, including their selective system. They were represented by H. C. Goldnick and C. F. Hartung.

The National Carbon Company of Cleveland, O., were represented by an exhibit in charge of Mr. F. H. Murray, Pacific Coast representative.

The National Telephone Selector Company of New York had an exhibit in charge of G. M. Seeley and E. Kleinschmidt. The selector which they displayed is an alternating current device.

The Buda Company of New York, Chicago and St. Louis exhibited an excellent motor car which received much favorable comment from those required to use cars for line inspection. Mr. C. H. Bull of Chicago was in charge of the exhibit.

The Western Electric Company displayed numerous and interesting electrical devices, among them the new Western Electric selector, which received many favorable comments from the visitors. Mr. E. K. Dyer, Pacific Coast salesman of San Francisco, and H. G. George, Los Angeles representative, were in charge of the exhibit.

The Railway Safety Signal Company had an elaborate exhibit, consisting of miniature locomotives and rails equipped with effective signalling devices for prevention of accidents caused by mistaken or neglected train orders, front or rear end collisions, open or partially open switches, side wipe from cars on sidings, destroyed or defective bridges, broken rails and landslides.

The Standard Underground Cable Company of Pittsburg, Pa., had an elaborate display of underground, aerial and inside wires and cables for fire alarm and police telegraph systems, submarine telegraph and telephone cable, and steel core copper sheath line wire. Messrs. A. B. Saurman and C. G. Pyle were in charge of the exhibit.

The exhibit of the United States Electric Company of New York was in charge of M. E. Launbranch of Chicago and Charles M. Sigison of New York. They displayed a full line of their Gill selectors, showing how they may be used in connection with semaphore signalling, as well as in telephone dispatching.

The Western Engineering Specialties Company of Denver, Colo., exhibited a device for the protection of telephone lines or other circuits at transmission line crossings, protecting the lower circuits from being subjected to the high potentials in case the transmission lines should break. It eliminated the basket form of protector, which is often an additional source of danger, especially where the baskets are made of metal. Mr. J. F. Dostal was in charge of the exhibit.

The exhibit of the General Railway Signal Company of Rochester, N. Y., was in charge of G. H. Groce, E. Parsons and M. F. Geer. The system which they displayed can be arranged for calling the dispatcher's office only, or for calling between stations, in either of which cases the instruments are bridged on the line and calls made without the use of

local battery. Alternating current or direct current ringers may be used in either case.

The Intensifier Company was represented by Mr. R. A. Beck of the Atchison, Topeka & Santa Fe Railway, Lamar, Colo., and Mr. C. A. Parker, Superintendent of Telegraph of the Denver, Northwestern & Pacific Railroad, Denver, who showed the operation of the telegraphic intensifier. The use of these intensifiers makes it practicable for the operator to copy with a typewriter direct from the standard relay without the resonator, local sounder or battery, using this instrument and the stroke of the armature of the relay to produce the sound. No change is made in the relay. The main line is not affected in any way by its use. Mr. Beck is the inventor of this device.

NOTES OF THE CONVENTION.

At the dinner Tuesday evening at Ocean Park Mrs. W. W. Ryder, in behalf of the association, presented the daughter of Mr. I. T. Dyer with a beautiful gold watch, the occasion being her eighteenth birthday.

Mr. L. C. McIntosh of the Southern Pacific Railroad, Los Angeles, an old and esteemed friend of the Telegraph and Telephone Age, looked after our interests at the convention in a most satisfactory manner.

It was the general consensus of opinion of those present at the convention that more actual work was accomplished and more entertainment enjoyed at this meeting than at any which has been held since the association was organized.

NOTE: By action of the Executive Committee, the date of the next annual meeting was changed to Monday, June 19th, 1911.

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**NEXT ANNUAL
MEETING**

June 19th - 23rd, 1911

BOSTON, MASS.

ASSOCIATION

OF

Railway Telegraph Superintendents

PROCEEDINGS

OF THE

Annual Meeting Held at Los Angeles, Cal.

JUNE 20th, 21st, 22nd and 24th, 1910.

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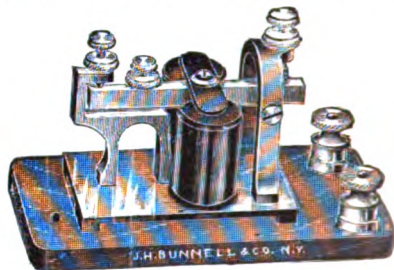
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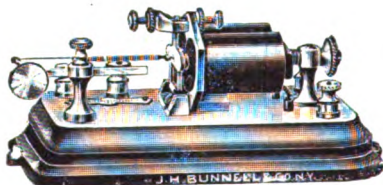
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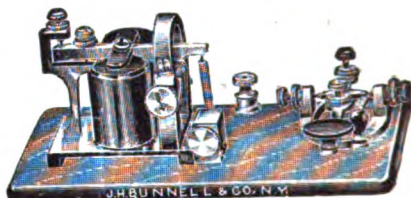
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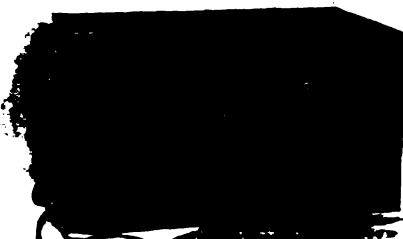
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The following resolution was adopted by the Association of Railway Telegraph Superintendents at the Annual Meeting held at Los Angeles, Cal., June 20-24:

"In view of the report of the Special Committee, it is the sense of this Association that the new agreement, **The Standard Telephone Operating Agreement for Railroads**, offers an equitable and comprehensive substitute for the old, or standard, railroad contract, for immediate negotiation by the railroads as may be best suited to their respective needs and circumstances."

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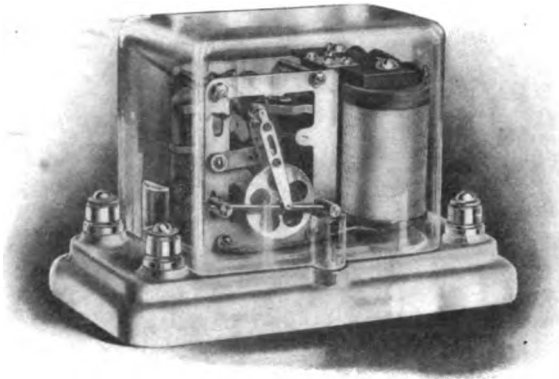
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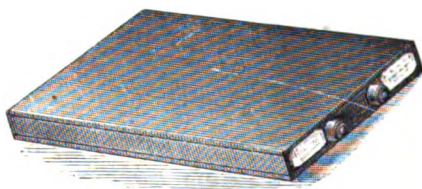
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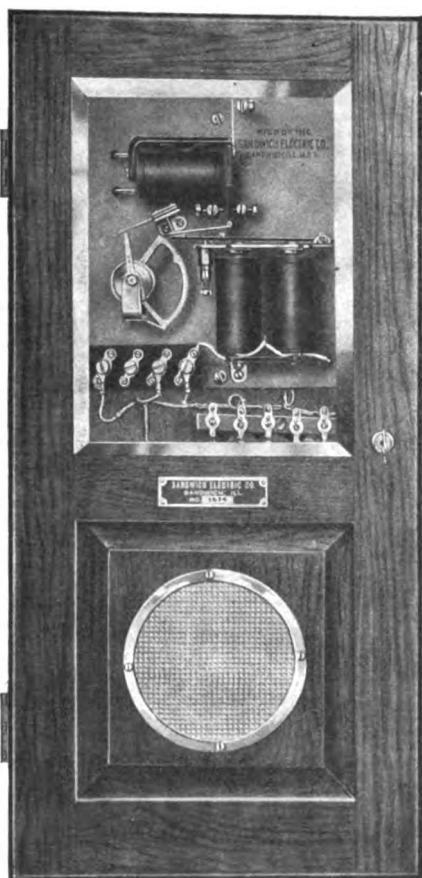
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